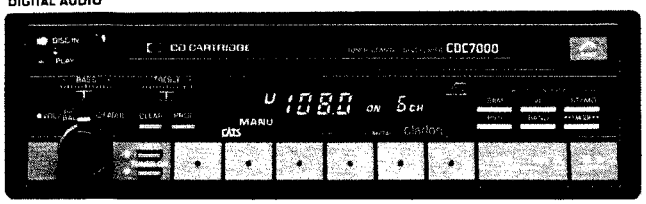
-22-3, Shibuya 2-chome, Shibuya-ku, Tokyo, 150 Japan Tel: 03-400-1121 Fax: 03-400-8679 Telex: J22908, J22152
i0 Kamitoda, Toda-shi, Saitama, 335 Japan Tel: 0484-43-1111 Telex: J2962628 CLAFAC-J

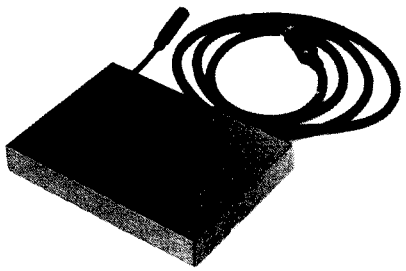
clarion Service Manual

Published by Service Administration Section

COMPACT disc DIGITAL AUDIO CD CARTRIDGE



Model PE-2004A



Model EE-695A

TUNER/COMPACT DISC PLAYER

Model CDC7000

(UE-598A)

(PE-2004A : CD PLAYER
EE-695A : TUNER UNIT)

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

CAUTION: USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE. DO NOT LOOK INTO THE OPTICAL LENS AT ANYTIME.

NOTES: After completion of the connection and installation, be sure to press the reset button for a few seconds to initialize the unit.

PE-2004A

SPECIFICATIONS:

CD SECTION

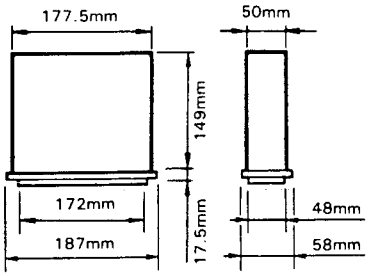
System:	Car audio compact disc player with CD cartridge system
Frequency Response:	20–20,000 Hz (+0/–3 dB)
Harmonic Distortion:	Less than 0.05% (1 kHz, 0 dB ~ –40 dB)
Dynamic Range:	90 dB
Wow and Flutter:	Unmeasurable
Channel Separation:	85 dB (1 kHz)

TUNER SECTION

Tuning system:	PLL synthesizer tuner
Receiving frequency:	LW 153 to 281 kHz MW 531 to 1,602 kHz FM 87.5 to 108 MHz

GENERAL

Operating Voltage:	14.4 V CD (10.8 ~ 15.6 V allowable)
Grounding System:	Negative type
Power Consumption:	Less than 3 A (at max. output)
Dimensions	
CDC7000:	



Tuner Unit:	178 × 25 × 131 mm (W × H × D)
Power Unit:	93 × 25 × 54 mm (W × H × D)
Weight	
CDC7000:	1,650 g
Tuner Unit:	670 g
Power Unit:	300 g

COMPONENTS:

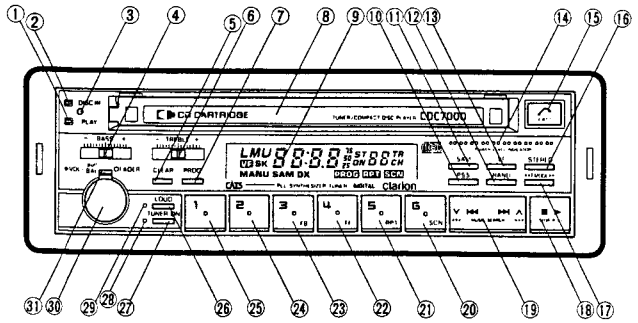
• CDC7000 (UE-598A-01)

CD player	PE-2004A-A	1
Tuner unit	EE-695A-51	1
CD cartridge	CAA-089-200	1
Ant. jumper	093-1041-00	1
Measurement gauge	285-1317-00	1
Mounting bracket	300-6954-00	1
Mounting bracket (for Tuner : R)	300-5946-02	1
Mounting bracket (for Tuner : L)	300-5946-03	1
Mounting bracket	300-7110-00	1
Parts bag	921-8293-00	1
Tap-screw	700-5016-80	2
Screw	716-0673-00	4
Plate nut	725-0216-00	2
Parts bag	921-8432-00	1
Hook plate	330-8216-00	2
Clamp	335-0833-01	4
Projection	335-2793-00	1
Rubber bushing	345-2934-00	1
Tap-screw	700-5016-80	1
Plate nut	725-0216-00	1
Parts bag	921-8442-00	1
Customer card	283-0184-01	1
Sticker (STOP)	291-0041-00	2
Escutcheon	370-4027-00	1

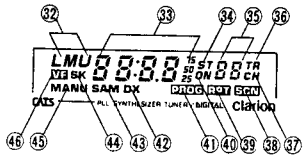
FEATURES:

- CD Cartridge System
- Motorized Auto Loading and Eject
- 3-Beam Laser Tracking System
- Random Program Play (Up to 20 songs)
- Audible 2-Speed FF/FB
- SAM II for FM (6 FM) ... Signal Auto Memory
- PSS ... Preset Signal Scan
- 2-Way SEEK (50kHz Step) & Manual (Up/Down 25kHz Step)
- LW 1 kHz Step SEEK & Manual
- One Touch Memory (6 FM, 6 MW, 6 LW)
- Auto DX/LO for SEEK
- VF Auto Retune
- CATS (Computer Anti-Theft System)
- BASS, TREBLE, FADER, LOUDNESS

■ NAME OF CONTROLS AND FUNCTIONS (Front View)



■ LCD DISPLAY



① PLAY indicator
② DISC IN indicator
③ RESET button
④ BASS control knob
⑤ CLEAR button
⑥ TREBLE control knob
⑦ PROGRAM button (PROG)
⑧ Disc slot door
⑨ Digital indicator display
⑩ Preset Scan button (PSS)
⑪ Signal Auto Memory button (SAM)
⑫ BAND button
⑬ VF button
⑭ Power level indicator
⑮ EJECT button
⑯ STEREO button
⑰ Tuning Mode button (T.MODE)
⑱ STOP/PLAY button (■ /▶)
⑲ MUSIC SEARCH/Up, Down button (V ⏮ ⏭ Λ)
⑳ Preset/Scan button (6/SCN)
㉑ Preset/Repeat button (5/RPT)
㉒ Preset/Fast forward button (4/FF)
㉓ Preset/Fast backward button (3/FB)
㉔ Preset button (2)
㉕ Preset button (1)
㉖ LOUD button
㉗ TUNER ON button
㉘ TUNER ON indicator
㉙ LOUD indicator
㉚ Volume control and pull Balance control knob (VOL/pull BAL)
㉛ FADER control knob
㉜ Band indicator (L/M/U)
㉝ Digital display (frequency/Elapsed time)
㉞ Stereo indicator (ST)
㉟ Channel/Track number display
㊱ Track indicator (TR)
㊲ Channel indicator (CH)
㊳ SCAN indicator (SCN)
㊴ REPEAT indicator (RPT)
㊵ Stereo button on indicator (ON)
㊶ PROGRAM indicator (PROG)
㊷ DX indicator
㊸ SAM indicator
㊹ SK indicator
㊺ Manual tuning indicator (MANU)
㊻ VF indicator

■ TUNER SECTION

* **TUNER ON button** ☛ ㉗, ㉘, ㉝
Press this button to turn the tuner on. The TUNER ON indicator (red) ㉘ will light up, and the digital display will show the tuning frequency. If pressed during CD playback, the unit will switch to tuner operation.

* **LW/MW/FM BAND selection button (LMU)** ☛ ⑫, ㉜
Each time this button is pressed, the band changes in the following sequence: FM (UKW) → MW → LW → FM(UKW) and so on.

* **T.MODE button** ☛ ⑰, ㊼
Use this button to select between the manual and seek tuning modes. The MANU indication in the display goes on and off each time this button is pressed.

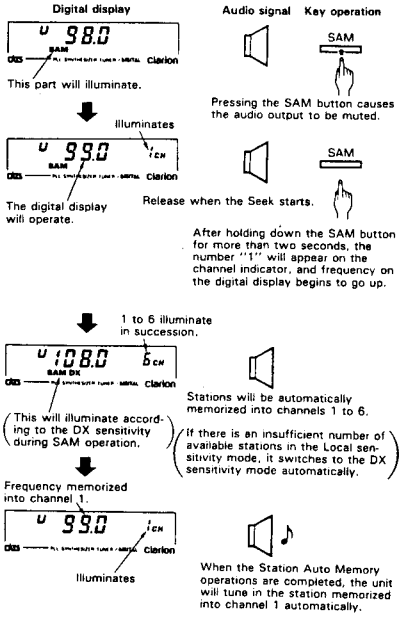
* **Manual tuning** ☛ ⑰, ⑲, ㊺, ㉝
Press the T.MODE button so that the MANU indication lights up. Press the Λ button to increase the tuning frequency, and the V button to decrease it. Keep the button pressed for continuous frequency change; press and release to change the frequency in increments of 25 kHz for FM, 9 kHz for MW and 1 kHz for LW.

* **Seek tuning button (Auto DX/Local)** ☛ ⑰, ⑲, ㊷, ㉝
Automatic tuning is possible by pressing this button. Pressing the right (left) side of the button will cause the tuner to search for broadcasting stations at higher (lower) frequencies and to stop when the next station is tuned in. The frequency goes up (goes down) by 50 kHz for FM, 9 kHz for MW and 1 kHz for LW. When the Seek tuning button is pressed for the first time, the unit searches for strong signal stations, using the Local sensitivity setting. However, after it returns to the frequency from which the Seek started initially, it will start searching for weaker signal stations, using the DX sensitivity setting.
Pressing the Seek tuning button again during Local sensitivity seek, automatically set the DX sensitivity setting and start the seek again from the frequency initial received.

* **Preset buttons** ☛ ⑳ – ㉕
It is possible to program six stations each for LW, MW, and FM bands.
  - If the preset button is held down for less than two seconds, the Station Recall function will be selected.
  - If the preset button is held down for two seconds or more, the Station Memory function will be selected.
    1. Select the desired station to be stored by either SEEK or MANUAL tuning.
    2. Press the desired touchbutton for MORE THAN 2 SECONDS. When you hear the station start to play and a tone beep, the new station has been stored into Memory. A touchbutton indicator number will show in the display indicating which touchbutton you have depressed.

* **PSS (Preset Signal Scan) button** ☛ ⑩, ㊲
Press this button to activate the Preset Scan mode. This will instruct the Tuner to scan each of the stations that you have stored in the touchbutton memory ("CH" indicator will flash). The Tuner will play each station for approximately 5 seconds and then skip to the next position.
To stop the scan action, press either the PSS again or press the appropriate preset button that you decide upon.

* **SAM (Signal Auto Memory) button (This function operates only on FM band)** ☛ ⑪, ㊸
Additional six FM stations can be memorized besides already preset stations in the SAM mode. The SAM button functions in two different ways according to how long it is being pressed.
1. Press the SAM button for less than two seconds to switch SAM/NORMAL MODE. In the SAM mode, the SAM indicator illuminates. With the operations for Station Memory while the SAM indicator is on, those stations can be preset and recalled in the SAM mode.
2. Press the SAM button for more than two seconds for Auto Memory.


Digital display
Audio signal
Key operation
SAM
This part will illuminate.
Pressing the SAM button causes the audio output to be muted.
Illuminates
Release when the Seek starts.
The digital display will operate.
After holding down the SAM button for more than two seconds, the number "1" will appear on the channel indicator, and frequency on the digital display begins to go up.
1 to 6 illuminate in succession.
Stations will be automatically memorized into channels 1 to 6.
This will illuminate according to the DX sensitivity during SAM operation.
If there is an insufficient number of available stations in the Local sensitivity mode, it switches to the DX sensitivity mode automatically.
Frequency memorized into channel 1.
Illuminates
When the Station Auto Memory operations are completed, the unit will tune in the station memorized into channel 1 automatically.

* **STEREO button** ☛ ⑯, ㉞, ㊵
Press this button so the ON indicator lights.
Upon receiving a stereo broadcast, the ST indicator lights, giving you the pleasure of listening to stereo programs.

* **VF button** ☛ ⑬, ㊻, ㊻
When the VF button is pressed, seeking is performed in the upward direction and automatically stops at stations broadcasting traffic information.
The "SK" indication is displayed while reception of a traffic information station takes place.
  - **Tuning to a traffic information station during CD playback:**
    Press the VF button and tune in a traffic information station. Then, start CD playback (traffic informaiton stations can also be tuned during CD playback). When a traffic information is broadcast, CD operation will automatically stop, and the unit will enter the tuner mode. When the announcement is finished, CD playback will restart from the point where it was interrupted.

* **VF auto retune**
Approx. 25 seconds after reception conditions deteriorate to a certain degree while listening to a traffic information announcement, the unit will automatically start seeking upwards for another traffic information station.

* **VF preset scan** ☛ ⑬, ⑩
Press the PSS button after pressing the VF button, and the unit will start scanning only the traffic information stations among the preset radio stations. To cancel this function, press the PSS button again.

* **VF SAM** ☛ ⑬, ⑪
If the SAM button is pressed after pressing the VF button, only traffic information stations will be memorized.

■ CD PLAYER SECTION

* **DISC IN indicator** ☛ ②
This red LED lights when a cartridge is loaded in the set, and flashes while the cartridge is being loaded and set.

* **PLAY indicator** ☛ ①
This indicator lights up when play starts after loading a compact disc. It remains off in the stop mode.

* **Disc slot** ☛ ⑧
Insert the compact disc packed with CD cartridge into this slot.

* **Fast forward/backward button (FF, FB)** ☛ ㉒, ㉓
Press either of these buttons to fast forward or reverse the play. While either of these buttons is pressed, the cue or review sound can be heard.
When either of these buttons is kept pressed for more than about 3 seconds, the fast forward or reverse speed increases.

* **STOP/PLAY button (■ /▶)** ☛ ⑱
Press this button to stop playback. The unit will enter the stop mode, and power will go off. Press this button again to resume play from nearly the same point of the disc.
When this button is pressed during SCAN play, the scanning operation is cancelled.
If the TUNER ON button is pressed during CD playback, the CD player automatically stops, and the unit enters the tuner mode. To restart CD operation, press the STOP/PLAY button.

* **EJECT button (⏏)** ☛ ⑮
Press this button to eject the CD cartridge. When the CD cartridge is inserted into the disc slot, the disc indicator flashes for a few seconds, then remains on. The EJECT button might not operate if pressed too lightly. Hold it down firmly for 1 second, then remove the cartridge.

* **REPEAT button** ☛ ㉑
Press this button to play the present selection repeatedly. The RPT (repeat) indicator will light up in the display panel. To cancel the repeat operation, press the REPEAT button again.

Note: The REPEAT and SCAN functions cancel each other, the button pressed last having priority. These operations are also canceled when the EJECT button is pressed.

* **SCAN button** ☛ ⑳
Press this button to find a specific track on the disc. The SCN indicator will light up in the display, and the first 10 seconds of each track will be automatically played in succession. Press the SCAN button again to stop this operation. It is also cancelled when the FF, FB or MUSIC SEARCH button is pressed.

* **RESET button** ☛ ③
This button is used to initialize operation of the unit. Always press this button before operating the unit after making or changing connections. Also press it to restore normal operation if an abnormality occurs during CD playback.
Use a pointed tool to press this button.

* **MUSIC SEARCH button (⏮, ⏭)** ☛ ⑲
Press either of this button to search for the desired selection.
When the ⏮ side of this button is pressed during play, play starts at the beginning of the current selection.
When the ⏮ side of this button is pressed consequently, play starts at the beginning of the previous selection.
When the ⏭ side of this button is pressed during play, play starts at the beginning of the next selection.

* **CLEAR button** ☛ ⑤
Press this button for 2 seconds to erase memorized selections.
Note: This function does not work with the cartridge ejected or the ACC power off.

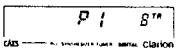
- **A suggestion for program play enjoyment**
The program memory is not erased when ejecting the disc, so you can use the memorized track numbers with another disc without having to program again.

Note 1: If none of the track numbers preset for programmed play apply, the set will return to the normal play mode, but the elapsed time will not be displayed and the sound may break every few seconds. If this happens, press and hold in the reset button for at least two seconds to clear the memory. The clock memory will be cleared when the reset button is pressed, so set the time again. (Press the reset button with the ACC power on.)

Note 2: Program play, as well as normal play, is performed endlessly, and can be used in combination with the FF, FB, music search, scan and repeat functions.

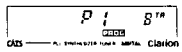
* **PROG button** ☛ ⑦
Use this button to memorize up to 20 selections and to play them back in the programmed order.

- **Memorizing selections**
1. Use the MUSIC SEARCH button to select the desired track number.
2. Press the PROG button for 2 seconds, and an indication will be displayed. This completes memorization.

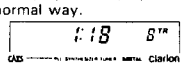


This indication shows that track 8 has been programmed in first place.
3. Repeat this procedure to program other selections. Up to 20 selections can be memorized.

- **Program play procedure**
1. Once memorization has been completed, press the PROG button again. The indication in the figure will be displayed, and selections will be played back in the programmed order.



2. To switch from program play to normal play, press the PROG button once again. The indication in the figure will be displayed, and playback will continue in the normal way.



■LIQUID CRYSTAL DISPLAY (LCD DISPLAY)

* **Track indicator** ☛ ㉟, ㊱
This indicates the number of the track being played, from "1" to the highest track number on the compact disc.

* **PROG indicator** ☛ ㊶
Lights up when the PROG button is pressed to start program play operation.

* **Elapsed time indicator (minutes and seconds)**
This indicates in minutes and seconds the time elapsed from the beginning of the track being played.

* **The 8888 indication**
If the car internal temperature becomes too high, for example when parked for an extended period in the sun, operation might be stopped in order to protect the internal circuitry. This is shown by the 8888 indication. When temperature in the car returns to normal, play will be resumed automatically.
Note: There is no problem with the player. Simply wait until the temperature returns to normal.

■CATS

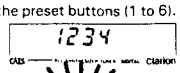
(COMPUTER-CONTROLLED ANTI-THEFT SYSTEM):

I. Operation

(1) CATS No. Input

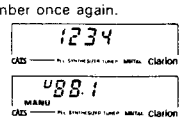
① Set the TUNER ON button to OFF.
② Press the TUNER ON button while holding the T.MODE button down.
(0000 indication flashes)

③ Enter a 4-digit number with the preset buttons (1 to 6).
(Example: 1, 2, 3, 4)



(the 0000 indication starts flashing again after input)

④ Enter the same 4-digit number once again.
(input 1, 2, 3, 4)
This finishes the CATS No. input procedure. The unit will return to normal operation.

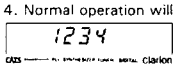


Note:
If you want to change the number entered in step ③, input a different 4-digit number in step ④. Then you will be able to repeat the operation from step ③.

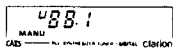
(2) Returning the unit to normal operation

When the unit is removed or the car is sent in for servicing, the correct CATS No. should be input to operate the CD player.
① Set the TUNER ON button to ON.
(0000 indication flashes)

② Input your CATS No. with the preset buttons (1 to 6).
For example, enter 1, 2, 3, 4. Normal operation will be resumed immediately.

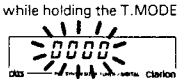


Note:
If you enter a wrong CATS No. in step ②, the CD player will turn itself off, and the TUNER ON button will become inoperative for approx. 2 minutes. After this period, repeat this procedure from step ①.

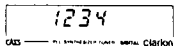


(3) Erasing the CATS No. (cancelling CATS function)

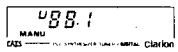
① Set the TUNER ON button to OFF.
② Press the TUNER ON button while holding the T.MODE button down.
(0000 indication flashes)



③ Input your CATS No.
For example, enter 1, 2, 3, 4. After erasure has been completed normal operation will be resumed, but the CATS function will not work.

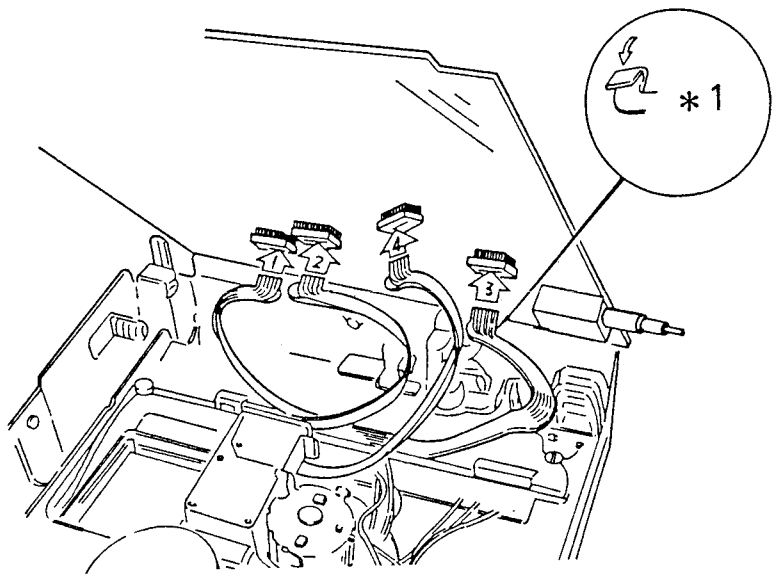


Note:
If you input a wrong CATS No. in step ③, the unit will return to the condition in step ①.

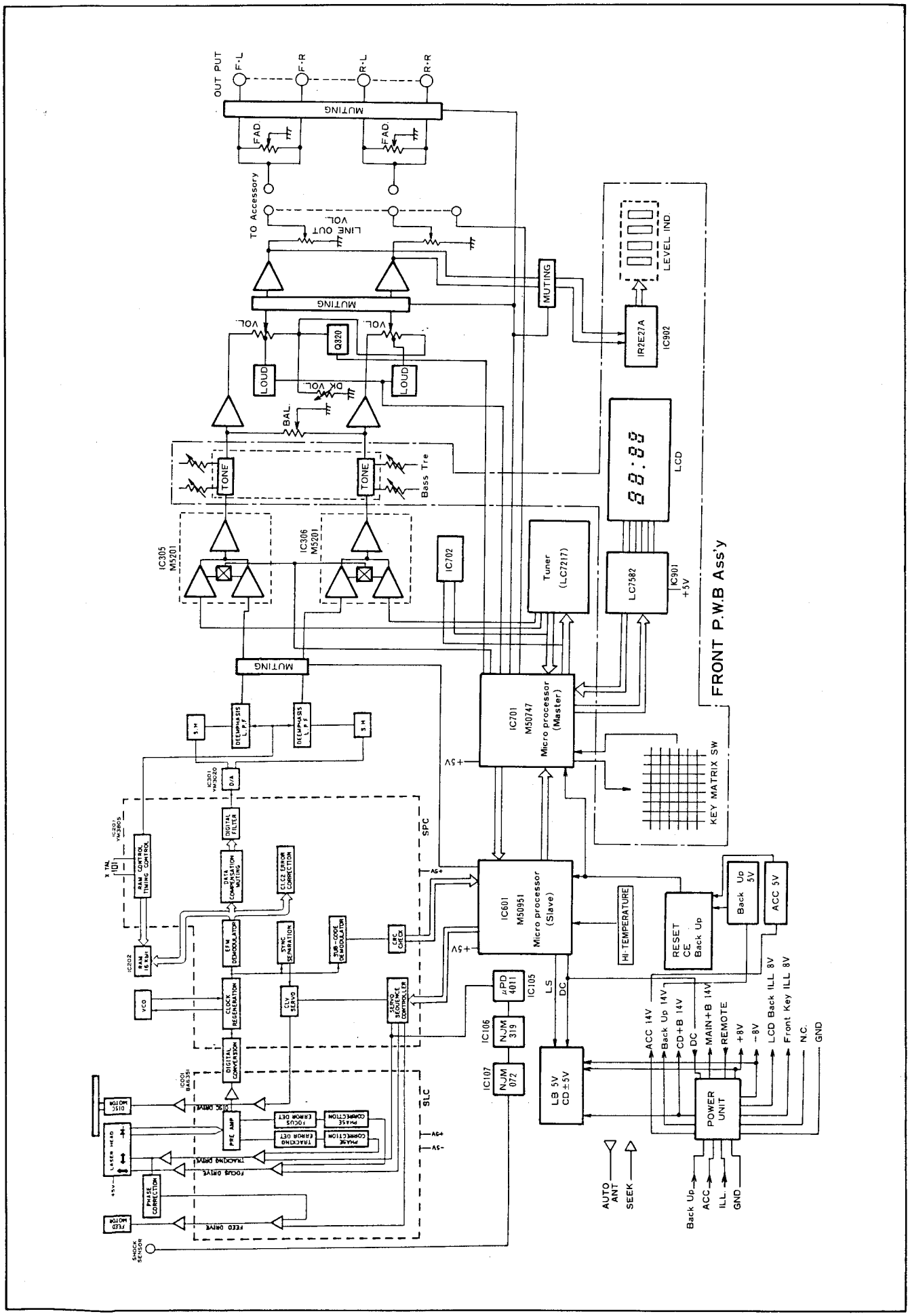


■FLEXIBLE P.W.B WIRING DIAGRAM:

* 1) NOTE: To avoid loose connector, fold back a crase of Flexible P.W.B end insert it to connector.



■BLOCK DIAGRAM:

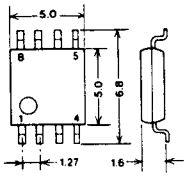


■EXPLANATION OF IC's:

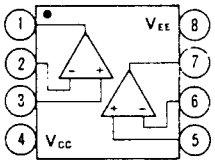
Refer to description in IC service manual vol 2.		
TA78008AP	051-0624-00	P50
TA78L006AP	051-0296-01	P48
NJM4558M	051-0350-55	P39
NJM2903	051-0599-51	P42
S8052ALO	051-0820-00	P51
S8054ALB	051-0821-00	P51

■NJM072M 051-1027-00 Dual J-FET OP Amp.

Outward Form



Block Diagram

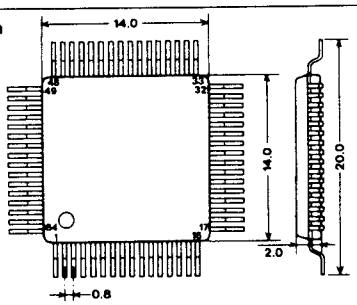


Features

This IC is an operational amplifier with 2 circuits, and its input row is configurated with J-FET. It has such features as high slew rate (standard 13 V/μs), high input impedance, low bias current (max. 200 pA) and low input offset current (max. 10mV).

■LC7582 051-0836-00 Driver For LCD-Display

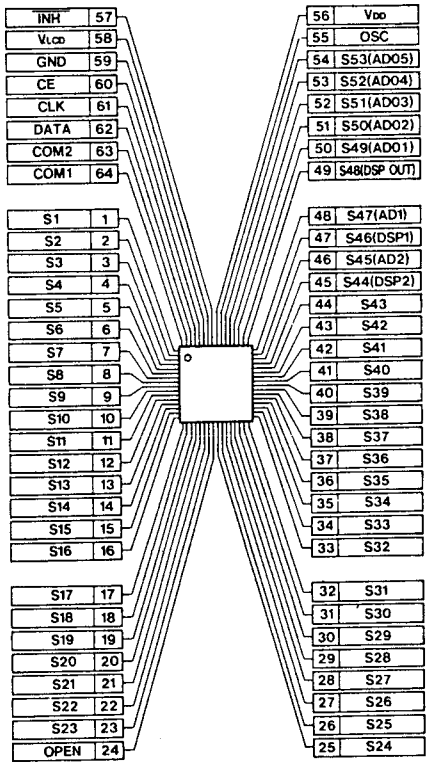
Outward Form



Features

- LC7582 is LCD-driver by micro-computer control or frequency display of electronic tuning.
- Driving system is made up of 1/1 duty (53 segments) and 1/2 duty (104 segments).
- Data input is made with serial-in 3 pcs.
- 5-level AD-converter is provided with 2 terminals. (as with level-meter use)
- Display for direct expression (DSP) with 2 terminals.
- With $\overline{INH}$ terminal for putting out the display.

Terminal Connection

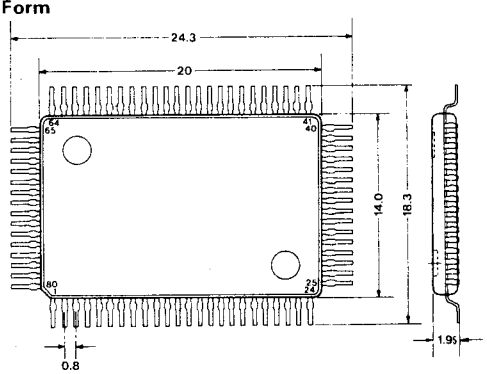


Terminal Function Table

Pin No.	Terminal Name	Function
1 ~ 23	S1 ~ S23	Segment output terminal.
25 ~ 44	S24 ~ S43	
24	OPEN	NC
45	S44(DSP2)	Segment output or DSP input.
47	S46(DSP1)	
46	S45(AD2)	Segment output or AD input.
48	S47(AD7)	
49	S48(DSP OUT)	Segment output or DSP output.
50 ~ 54	S49(AD 01) ~ S53(AD 05)	Segment output or AD output.
55	OSC	Oscillation terminal.
56	V_{DD}	Power supply terminal.
57	$\overline{INH}$	Display-putting off input terminal (It is effective for output driver alone, thus it is possible to transfer the serial data during the putting-out of lamp).
58	V_{LCD}	LCD Bias voltage terminal.
59	GND	Ground.
60	CE	Input terminal for transferring the serial data.
61	CLK	
62	DATA	
63	COM2	Common output terminal. (Using COM1 alone at time of 1/1 duty)
64	COM1	

■YM3805 653-0069-88 Signal Processor & Controller for Compact Disc Player

I. Outward Form

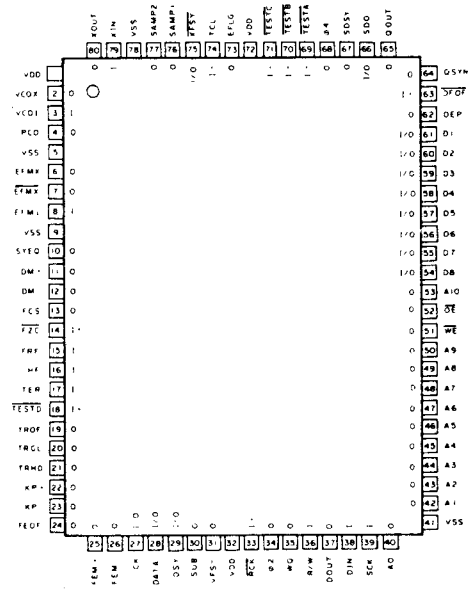


II. Outline

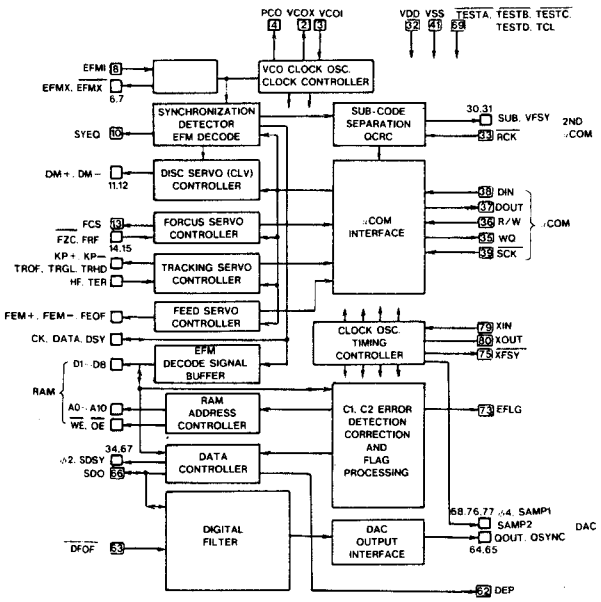
YM-3805 is a CMOS LSI for signal processing and servo control of the compact disc player.

It executes such signal processing as demodulation of the EFM signal from the optical pick-up, detection and correction of the erroneous signal and digital filtering which helps to improve the sound quality, as well as such intelligent servo controlling as focus, disc, tracking and feeding.

III. Terminal Connection

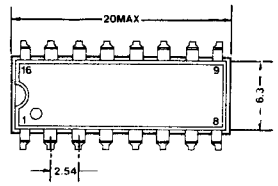


Ⅳ. Block Diagram



■YM3020 653-0069-87 Floating D/A Converter

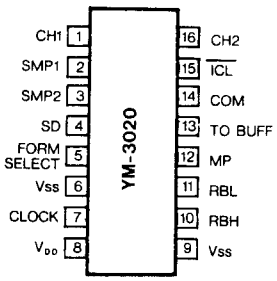
Ⅰ. Outward Form



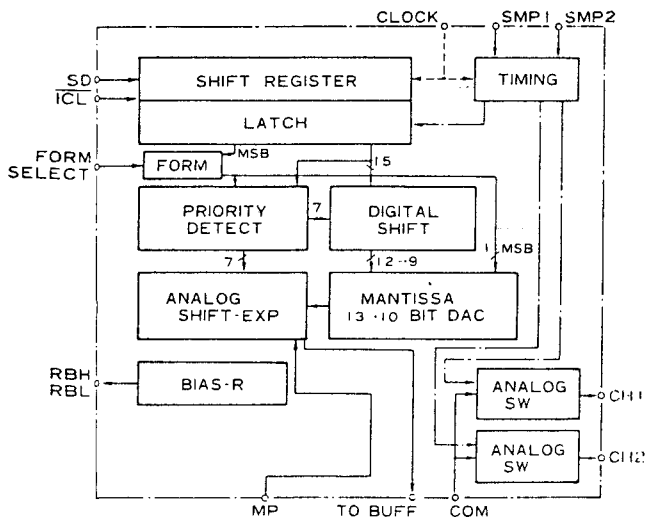
Ⅱ. Outline

DAC-FS is a 2-channel serial and 16-bit binary or 2's complement input type floating D/A converter. It is capable of generating the analog output (dynamic range 16 bit) that has 13-bit mantissa and 7-step exponent corresponding to the digital input signal.

Ⅲ. Terminal Connection



Ⅳ. Block Diagram

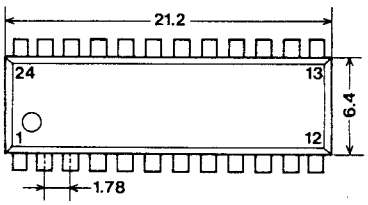


Ⅴ. Terminal Description

Pin No	Name	Description
1	Vout CH1	Sample hold analog switch output for CH1.
2	SMP1	Block of "1" becomes sampling period for CH1.
3	SMP2	Block of "1" becomes sampling period for CH2. Using trailing edge of SMP1 and SMP2, internal signal is produced to latch serial data.
4	SD	Serial input of digital signal to be converted.
5	FORM SELECT	Responds to binary input form at "1" and 2's complement input form at "0".
6	Vss	Low electric potential side power supply (GND)
7	CLOCK	Clock to drive shift register and timing generator (ϕ4.3218MHz)
8	V_{DD}	High electric potential side reference power supply (GND)
9	Vss	Low electric potential side reference power supply (GND)
10	RBH	As identical resistors are included between RBH pin and internal V_{DD} power supply and between RBL pin and Vss (GND) power supply, connecting both pins provides highly accurate 1/2 V_{DD} voltage which is applied to MP pin via buffer operational amplifier.
11	RBL	Capable of compensating voltage deviation from 1/2 V_{DD} with suitable resister externally added to either terminal.
12	MP	Executes exponential analog shift using electric potential given to MP as standard Biases to 1/2 V_{DD} normally.
13	To BUFF	Analog output of DAC
14	COM	Common input of analog switch for CH1 and CH2
15	ICL	Becomes signal-less output regardless of "1" – normal operation and "0" – SD signals
16	Vout CH2	Sample hold analog switch output for CH2

■LC7217 051-0867-00 Electronic Tuning PLL Frequency Synthesizer for AV

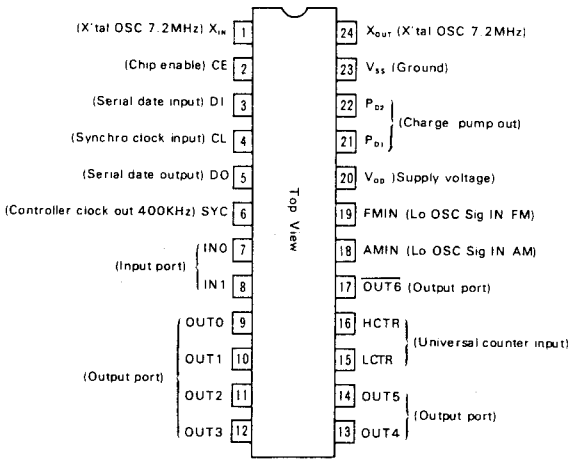
Outward Form



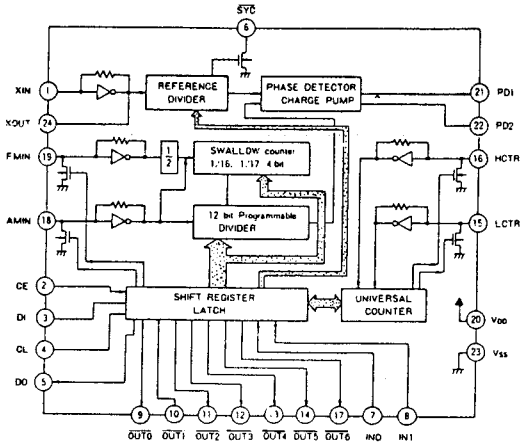
Features

Abundant reference frequency I/O ports for AV. General purpose counter built in

Terminal Connection

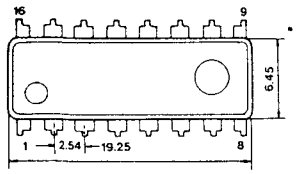


Block Diagram

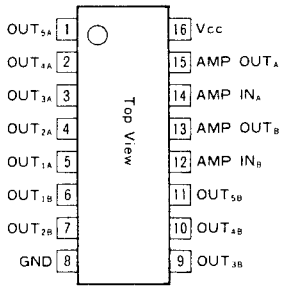


■IR2E27A 051-1026-00 5dot×2channel LED driver

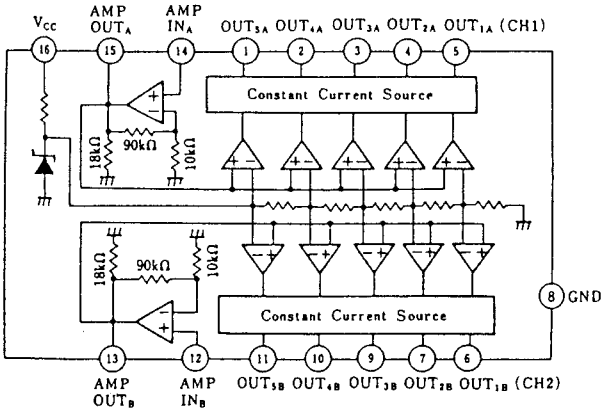
Outward Form



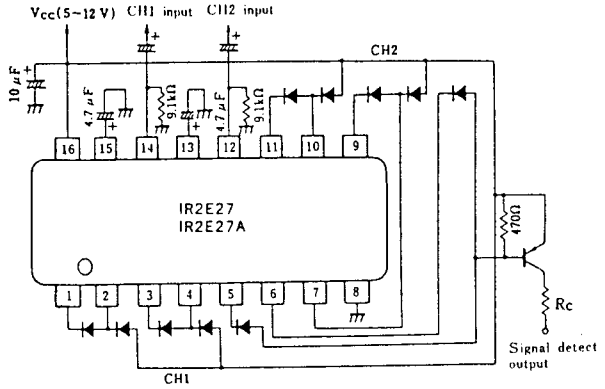
Terminal Connection



Block Diagram

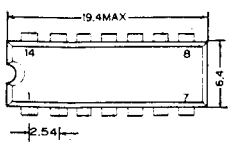


Typical Application

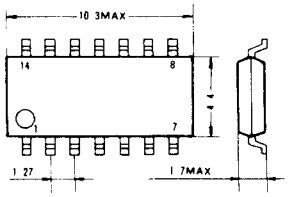


■μPD4011BC 051-0172-50 μPD4011BG 051-0172-55 QUAD 2 INPUT NAND GATE

Outward Form

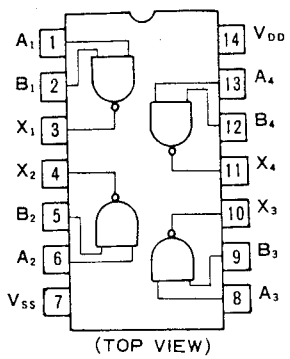


C Type



G Type

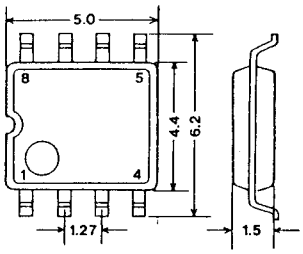
Block Diagram



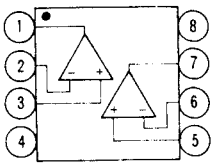
(TOP VIEW)

■BA4560F 051-0285-59 Dual OP Amp

Outward Form



Block Diagram

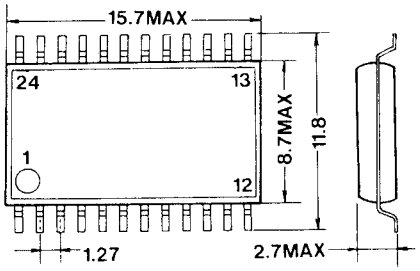


Features

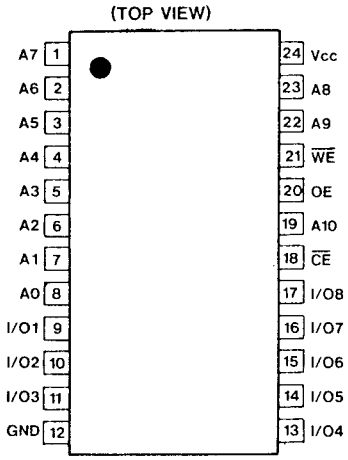
- High gain (standard 100dB), low noise
- Built-in phase compensation circuit
- Wide-band, high slew rate (standard 4.0V/μs)

■CXK5816M-15L 051-0805-55 2K-word×8-bit High Speed Static RAM

Outward Form



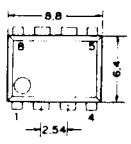
Terminal Connection



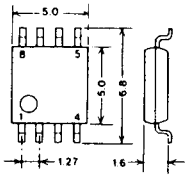
Symbol	Function
A0 - A10	Address input
I/O1 - I/O8	Data input/output
$\overline{CE}$	Chip inable input
$\overline{WE}$	Write inable input
$\overline{OE}$	Output inable input
V_{cc}	Power supply +5V
GND	Ground

NJM2043D 051-0994-00 ■NJM2043M 051-0994-01 NJM2043S 051-0851-00 Dual Pre-Amp.

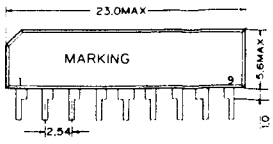
Outward Form



D TYPE

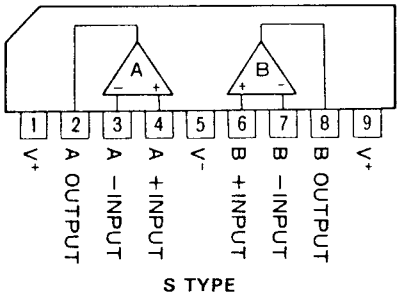


M TYPE

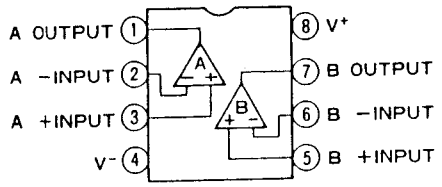


S TYPE

Block Diagram



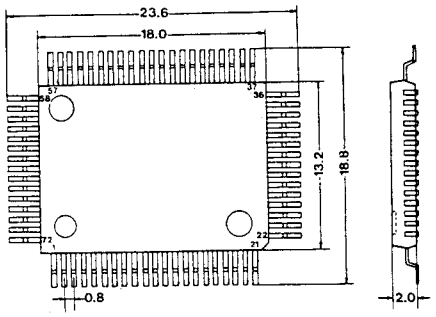
S TYPE



D TYPE, M TYPE

■M50747-420FP 051-1020-00 Control microcomputer of the CD player

Ⅰ. Outward Form

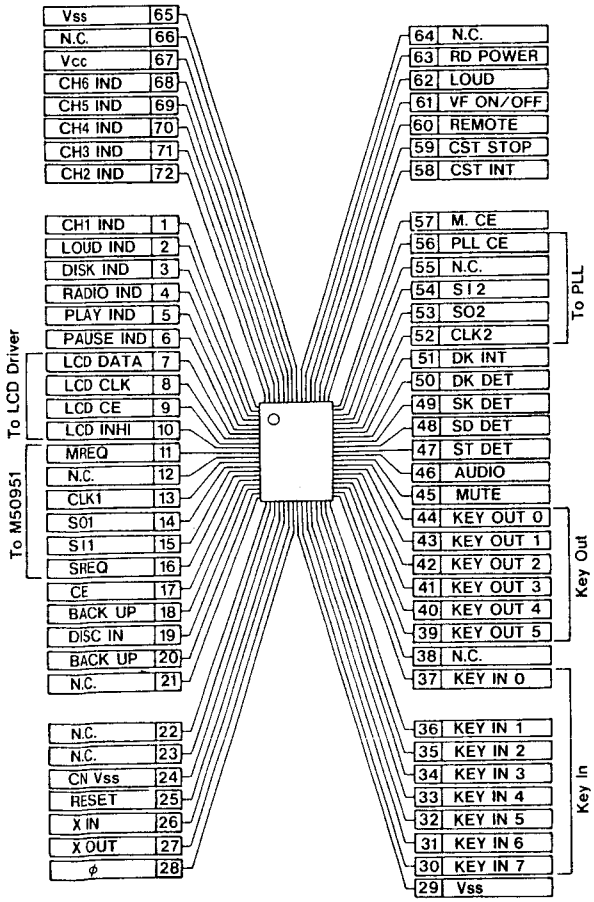


Ⅱ. Outline

This IC is a control microcomputer of the CD player with tuner control. It has the following functions:

- LC7217 (PLL & Expansion I/O IC) control
- LC7582 (LCD driver's IC) control
- M50951 (CD control IC) control
- Read on Key control

Ⅲ. Terminal Connection



Ⅳ. Terminal Function Table

Terminal No.	Terminal name	I/O	Active	Function	
1	CH1 IND	O	H	LED drive output.	
2	LOUD IND	O	H		
3	DISC IND	O	H		
4	RADIO IND	O	H		
5	PLAY IND	O	H		
6	PAUSE IND	O	H		
7	LCD DATA	O	–	Interface to the LCD driver.	DATA output
8	LCD CLK	O	–		CLOCK output
9	LCD CE	O	–		Chip enable terminal
10	LCD INHI	O	H		INHIBIT output (H: display/L: delete)
12	N.C.	–	–	Not in use.	
11	MREQ	O	L	Interface to the CD control microcomputer (M50951)	READY output
13	CLK1	I/O	–		CLOCK I/O
14	SO1	O	–		DATA output
15	SI1	I	–		DATA input
16	SREQ	I	L		READY input
17	CE	I	↓	ACC ON/OFF input. (L: ACC ON)	
18	BACK UP	I	–	Back up power ON/OFF detection input. (L: Power OFF)	
19	DISC IN	I	L	Disc IN detection input. (L: Disc IN)	
20	BACK UP	I	↓	Back up power ON/OFF input. (L: Power OFF)	
21 \ 23	N.C.	–	–	Not in use.	
24	CN Vss	–	–	Device ground terminal.	
25	RESET	–	–	Reset terminal.	
26 27	X IN X OUT	–	–	Terminal for connecting an ceramic resonator. (4MHz)	
28	φ	–	–	Not in use.	
29	Vss	–	–	Device ground terminal.	
30 \ 37	KEY IN 7 \ KEY IN 0	I	L	Key matrix signal input terminal. See "V Key Matrix".	
38	N.C.	–	–	Not in use.	
39 \ 44	KEY OUT 5 \ KEY OUT 0	O	L	Key matrix scan signal output terminal. See "V Key Matrix".	
45	MUTE	O	L	Mute signal output terminal. (L: Mute ON)	
46	AUDIO	O	–	Tuner/CD voice switching signal output terminal.	
47	ST DET	I	L	Stereo signal input terminal.	
48	SD DET	I	H	Station detection input. (H: station detection)	
49	SK DET	I	L	SK signal (traffic information station in Europe) detection input.	
50	DK DET	I	L	DK signal (signal indicating that traffic information is ON) detection input.	
51	DK INT	O	L	DK signal (signal indicating that traffic information is ON) detection output.	
52	CLK2	O	–	Interface to the PLL	CLOCK output
53	SO2	O	–		DATA output
54	SI2	I	–		DATA input
56	PLL CE	O	H		Chip enable
55	N.C.	–	–	Not in use.	
58	CST INT	I	L	Cassette interruption input terminal.	
59	CST STOP	O	H	Cassette stop control signal output terminal.	
60	REMOTE	O	L	Power supply ON/OFF control out terminal.	
61	VF ON/OFF	O	H	VF mode ON/OFF output. (H: ON)	
62	LOUD	O	H	LOUDNESS ON/OFF output. (H: ON)	
63	RD POWER	O	H	Radio power supply control output. (H: Power ON)	

Terminal No.	Terminal name	I/O	Active	Function
64	N.C.	–	–	Not in use.
65	Vss	–	–	Device ground terminal.
66	N.C.	–	–	Not in use.
67	Vcc	–	–	Power supply terminal.
68 \ 72	CH6 IND \ CH2 IND	O	H	CH6 - CH2 LED display signal output. (H: Display)

V. Key Matrix

§ 1. Key Matrix Connection Table

Key In \ Key Out	KEY OUT 0 Pin44	KEY OUT 1 Pin43	KEY OUT 2 Pin42	KEY OUT 3 Pin41	KEY OUT 4 Pin40	KEY OUT 5 Pin39
KEY IN 7 Pin30	EJECT	CLEAR	T. MODE	TUNER ON	AREA 1 (DS1)	
KEY IN 6 Pin31	STOP/PLAY	PROG	BAND	LOUD	AREA 2 (DS2)	EJE/HOLD (DS10)
KEY IN 5 Pin32	SEARCH − /DOWN	DOWN	M1	INIT	FM2 (DS3)	Dual/ Separate (DS11)
KEY IN 4 Pin33	SEARCH + /UP	UP	M2		LW (DS4)	Last Position Memory (DS12)
KEY IN 3 Pin34	M3/FB	FB	VF·ART/CLK		VF/ART CLK (DS5)	ST Port/Serial (DS13)
KEY IN 2 Pin35	M4/FF	FF	ST/BW/ART		AUTO Dx/Lo (DS6)	
KEY IN 1 Pin36	M5/RPT	M5	P. SCAN		F·RECAL (DS7)	
KEY IN 0 Pin37	M6/SCN	M6	A. STORE		IF COUNT (DS8)	BW/ART (DS16)

Momentary SW Diode SW

Note : Some of the sets equipped with this microcomputer are not provided with all the above keys.

§ 2. Diode Switches

In the following table, "0" denotes the diode switch being turned off (open), and "1" it being on (short-circuit).

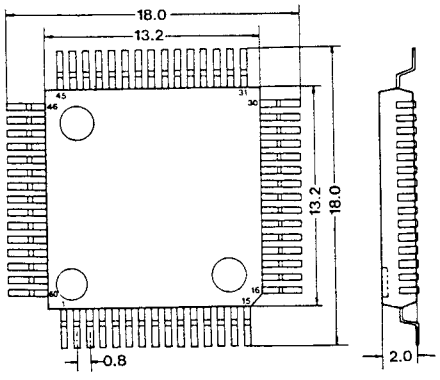
Symbol	SW Name	Function
DS1 DS2	AREA 1 AREA 2	These switches are used for setting a destination. AREA 1: Australia 1, Europe 0, U.S.A 1, Japan 0 AREA 2: Australia 1, Europe 1, U.S.A 0, Japan 0
DS3	FM2	For North America and Australia. FM2 is selected. (ON: Use)
DS4	LW	For Europe. LW band is selected. (ON: Use)
DS5	VF/ART CLK	For Europe: Selects VF and ART. (ON: VF, OFF: ART) Others: Selects CLOCK if you wish. (ON: Active)
DS6	AUTO Dx/Lo	Selects AUTO Dx/Local during RADIO SEEK. (ON: Use)
DS7	F·RECAL	Selects the read function of frequency display by T. MODE key during the CD play. (ON: Use)
DS8	IF COUNT	Selects the IF COUNT during tuning. (ON: Use) Note: IF COUNT is a function to confirm whether the station is received at auto and search tuning.
DS10	EJE/HOLD	Selects whether to operate AUTO EJECT when the Acc is OFF. (ON: AUTO EJECT, OFF: HOLD)
DS11	Dual/Separate	Selects whether to use the Dual Function Key mode. (ON: Separate, OFF: Dual)
DS12	Last Position Memory	Selects whether to maintain the memory of previous Disc's play status after EJECT. (ON: Use)
DS13	ST Port/Serial	Selects whether to input the ST signal directly from the Port or with serial communication from the PLL. (ON: Serial communication, OFF: Port input)
DS16	BW/ART	For North America, Australia and Japan: Selects B/W or ART to be used. (ON: B/W, OFF: ART)

§ 3. Momentary Switch

Switch name	Function
EJECT	Function to eject the CD cartridge.
STOP/PLAY	Play/Stop switch of CD operation.
SEARCH−/DOWN SEARCH+/UP	Dual: Track search during the CD player is operating. Tuning Up/Down while the radio is operating. Sep: Track search only.
M3/FB M4/FF	Dual: FF (fast forward) or FB (fast reverse) during the CD player is operating. Memory read/write of Ch3 and Ch4 during the radio is operating. Sep: Memory read/write of Ch3 and Ch4.
M5/RPT	Dual: Switch to repeat all the tracks/one track during the CD play. Ch5 memory read/write during the radio operation. Sep: Switch to repeat all the tracks/one track.
M6/SCN	Dual: Switching the SCAN mode during the CD play. Ch6 memory read/write during the radio operation. Sep: SCAN mode ON/OFF switch.
CLEAR	Clears the program memory of the CD.
PROG	Switching PROG play/Normal play of the CD, and writing to memory.
DOWN UP FB FF M5 M6	These keys have no effect during "Dual" mode. They function as above during "Sep" mode.
T. MODE	Reading function of frequency display (for 5 sec.) during the CD operation. Switching the mode of manual tuning/SEEK tuning during the radio operation.
BAND	Each band is selected as follows by the Band key. Japan: FM → AM Europe: FM → MW → (LW) U.S.A & Australia: FM1 → (FM2) → AM
M1 M2	Memory read/write of Ch1 & Ch2.
VF·ART/CLK	Europe: VF(ART) ON/OFF switch. Others: Reading function of clock display. (for 5 sec.)
ST/BW/ART	Europe: Forced mono ON/OFF function. Refer to "Diode SW DS16". Others BW: B/W (AM stereo) ON/OFF function.
P. SCAN	ON/OFF function of preset scan (calls each Ch for 5 sec.) of the tuner.
A. STORE	Start/End of automatic store of the tuner.
TUNER ON	Switching the Radio ON/OFF.
LOUD	Switching the LOUD ON/OFF.
INIT	Reset to initial status.

■M50951-403FP 051-1021-01 CD Control Micro Computer

I. Outward Form

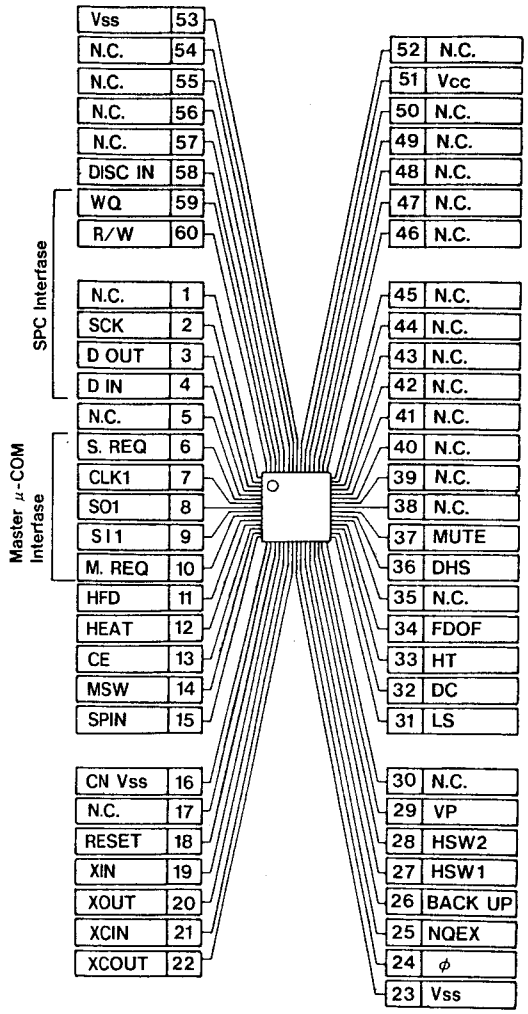


II. Outline

This IC is the control microcomputer of the CD unit.
It has the following functions:

(1) CD control by data command communication through key input from the master microcomputer.
(2) Clock function.
(3) Transmits the display data and clock data of the CD unit to the master microcomputer.

Ⅲ. Terminal Connection

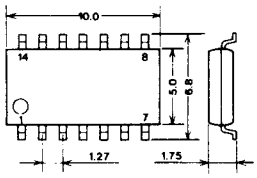


Ⅳ. Terminal Function Table

Terminal no.	Terminal name	I/O	Active	Function	
1	N.C	–	–	Not in use.	
2	SCK	O	–	Interface to the SPC IC.	CLOCK output
3	D OUT	O	–		DATA output
4	D IN	I	–		DATA input
5	N.C	–	–	Not in use.	
6	S. REQ	O	–	Interface to the master microcomputer (M50747).	READY output
7	CLK1	I/O	–		CLOCK IN/OUT
8	SO1	O	–		DATA output
9	SI1	I	–		DATA input
10	M. REQ	I	–		READY input
11	HFD	I	L	Mirror area detection input. (L: within mirror area)	
12	HEAT	I	L	High temperature detection input. (L: high temperature)	
13	CE	I	L	Acc ON/OFF detection input. (L: Acc ON)	
14	MSW	I	L	Magazine SW input. (L: magazine IN)	
15	SPIN	I	L	Disc rotation sensor pulse input.	
16	CN Vss	–	–	Devise ground terminal.	
17	N.C	–	–	Not in use.	
18	RESET	–	–	Reset terminal.	
19	XIN	–	–	Terminal for connecting an ceramic resonator. (4MHz)	
20	XOUT	–	–		
21	XCIN	–	–	Terminal for connecting an crystal resonator. (32kHz)	
22	XCOUT	–	–		
23	Vss	–	–	Device ground terminal.	
24	φ	–	–	Not in use.	
25	NQEX	I	L	Test mode terminal.	
26	BACK UP	I	L	Backup power ON/OFF detection input. (L: power OFF)	
27	HSW1	I	L	Pickup inner periphery limit SW input. (L: inner periphery SW ON)	
28	HSW2	I	L	Pickup outer periphery limit SW input. (L: outer periphery SW ON)	
29	VP	–	–	Device ground terminal.	
30	N.C.	–	–	Not in use.	
31	LS	O	H	Laser diode ON output. (H: Laser ON)	
32	DC	O	H	DD converter ON output. (H: Converter ON)	
33	HT	O	H	Feed motor high torque output. (H: High torque)	
34	FDOF	O	H	Feed motor off output. (H: Reset)	
35	N.C.	–	–	Not in use.	
36	DHS	O	H	Disc stop output. (output at H when high speed rotation)	
37	MUTE	O	L	Mute output. (L: Mute ON)	
38 ~ 50	N.C.	–	–	Not in use.	
51	Vcc	–	–	Power supply terminal.	
52	N.C	–	–	Not in use.	
53	Vss	–	–	Device ground terminal.	
54 ~ 57	N.C.	–	–	Not in use.	
58	DISC IN	O	L	DISC IN output. (L: Disc IN status)	
59	WQ	I	–	Interface to the SPC IC.	Write request signal output.
60	R/W	O	–		Read/Write signal output.

■NJM319M 051-1022-00 Dual Comparator

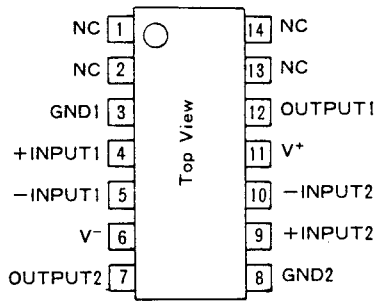
Outward Form



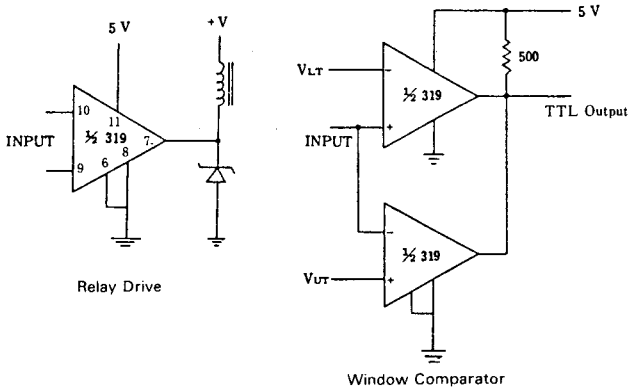
Outline

This IC is a high-speed and high-accuracy comparator with 2 circuits. It has a wide operating supply voltage, and is designed to start operation with a single power supply of 5V. Output conforming to the drives of lamps up to 25mA or relays, RTL, DTL or TTL can be obtained.

Terminal Connections

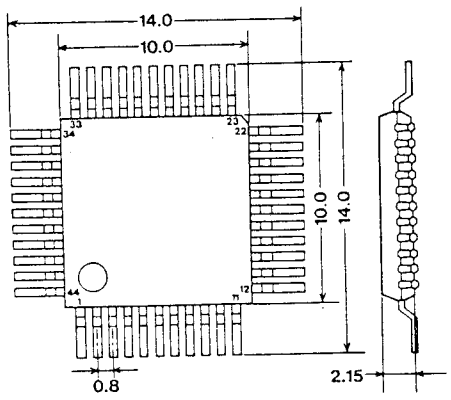


Circuit Diagram



■BA6351K 051-1025-00 Analog Servo for CD Players

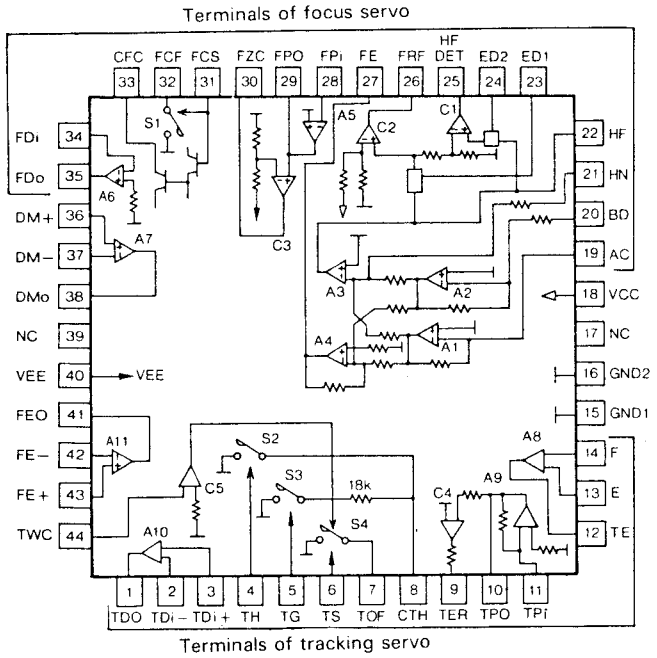
Outward Form



Outline

This IC contains the majority of pickup servo circuits of compact disc players. A 3-spot optical pickup is used. The servo of HF amplifier focus tracking and the drive amplifiers of focus, disc, feed and tracking are integrated.

Terminal Connection and Block Diagram



A 1	HF Amp (HF - A1)
A 2	HF Amp (HF - A2)
A 3	HF Amp (HF - A3)
A 4	Focus error comparator
A 5	Focus pre Amp
A 6	Focus drive Amp
A 7	Disk drive Amp
A 8	Tracking error Amp
A 9	Tracking pre Amp
A 10	Tracking drive Amp
A 11	Feed drive Amp

C 1	HF Drop comparator
C 2	FRF comparator
C 3	Focus zero-cross detector
C 4	Tracking zero-cross detector
C 5	Tracking drive limiter

S 1	Focus servo off sw
S 2	Tracking control sw
S 3	do
S 4	do

Terminal Function Table

Pin No.	Terminal Name	Function
1 2 3	TDO TDI− TDI+	Terminals of tracking servo: The tracking drive amplifier drives the tracking power amplifier and activates the tracking actuator.
4 5 6	TH TG TS	Terminals of tracking servo: This is the tracking jump control switch. TH : Tracking hold switch. TG : Gain control switch. TS : Tracking off switch.
7 8	TOF CTH	Terminals of tracking servo: This terminal controls the tracking group via Pins 4 to 6.
9	TER	Terminals of tracking servo: Output pin of the comparator of tracking zero-cross.
10 11	TPO TPI	Terminals of tracking servo: Input/output pin of the tracking preamplifier.
12 13 14	TE E F	Terminals of tracking servo: It constitutes the I-V conversion and the differential amplifier. The current obtained from sub-spot is converted, and the tracking error signal is generated by its difference.
15 16	GND1 GND2	Earth.
17	NC	Not in use.
18	Vcc	Power supply terminal.
19 20	AC BD	Terminals of focus servo: This terminal catches signals from the main spot with the photodiode, and receives their current. It is responsible for I-V conversion.
21 22	HN HF	Terminals of focus servo: Feedback and output terminals of HF (RF) signal. Pin 21 has built-in 5kΩ resistance as a part of the feedback resistance.
23 24	ED1 ED2	Terminals of focus servo: This terminal is for peak hold (Pin 23) and bottom hold (Pin 24) of the HF (RF) signal. The peak hold makes a time constant which can follow up lacking in the HF signal etc. The bottom hold makes a time constant which can also follow up the envelope variance when the track jump is operated.
25 26 30	HF DET FRF FZC	Terminals of focus servo: Output terminal of the servo IC for focus tracking control. HF : Outputs "L" on the disc track, "H" between the tracks (mirror area) and also "H" when a failure is detected. FRF : This circuit detects the existance of the reflected laser beam. FZC : This terminal detects the just focus point during the focus search.
28 29	FPI FPO	Terminals of focus servo: Preamplifier of focus error signal.
31	FCS	Terminals of focus servo: Input terminal of the focus search ON.
32	FOF	Terminals of focus servo: Muting transistor terminal for the focus loop OFF.
33	CFC	Terminals of focus servo: This terminal decides the constant during the focus search.
34 35	FDI FDO	Terminals of focus servo: Input/output pin of the focus drive amplifier.
36 37 38	DM+ DM− DMO	Input/output pin of disc drive amplifier.
39	NC	Not in use.
40	VEE	Negative power supply.
41 42 43	FEO FE− FE+	The feed drive amplifier drives the feed power amplifier and rotates the feed motor.
44	TWC	Limiter terminal of the tracking drive amplifier.

■ADJUSTMENTS:

- Necessary items

MEASURING INSTRUMENTS

DC power supply : x 1
Oscilloscope : x 2
(At least one shall have a bandwidth of 50 MHz or more)
Audio frequency oscillator (A.F. OSC): x 1
Laser power meter : x 1
(LEADER LPM-8000 or equivalent)
AC voltmeter (ACVM) : x 1
(One dual channel or two single channel meters)
DC voltmeter (DCVM) : x 1
Frequency counter (FC) : x 1

JIGS

Filter (See Fig. A) : x 1
Shorting cord : x 1
(Step 3 and 8)

TOOLS

Screwdriver : x 1
(For Pre-Set Potentiometer adjustment)
Core screwdriver : x 1 (Step 5)
(Nonferrous screwdriver)
Hexagonal wrench 0.89mm
: x 1 (Step 7)

TEST DISC (P/No. 642-0119-00)
YEDS-18 or Equivalent

- Precautions or Special Notes

1. Measure the output level at the output terminal of the AF oscillator.
2. CDC7000 should always be in horizontal position while performing adjustments.
   Especialy, at DISC loading and eject.

- Adjustment jig (with internal filter)

Connect the filter in Fig. A before measurement.

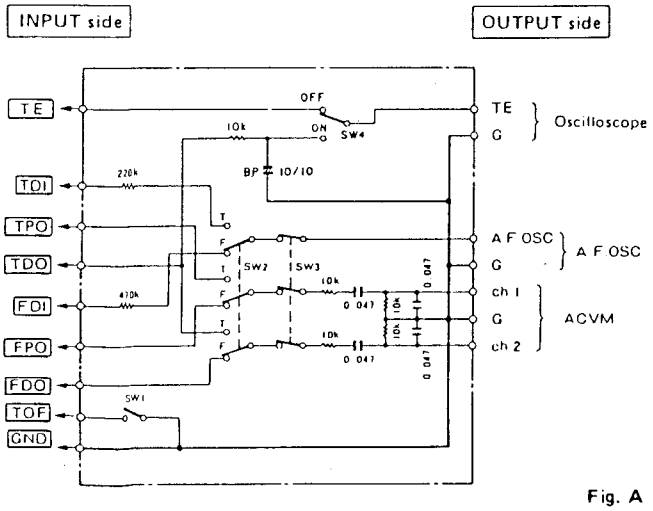


Fig. A

SW1: For diffraction grating and EF balance adjustments
SW2: FOCUS gain and TRACKING gain switching
SW3: Filter ON/OFF switch
SW4: Filter ON/OFF switch

★ Carry out following adjustments in the order as numbered.

Step 1. Confirmation of Laser Output
Step 2. Adjustment of Focus Offset
Step 3. Adjustment of Tracking Offset
Step 4. Confirmation of Focus Actuator Operation
Step 5. Adjustment of VCO
Step 6. Confirmation of Jitter
Step 7. Adjustment of Diffraction Grating
Step 8. Adjustment of EF Balance
Step 9. Adjustment of HF Level
Step 10. Adjustment of Focus Gain
Step 11. Adjustment of Tracking Gain
Step 12. Confirmation of Kick Gain
Step 13. Confirmation of Search Operation
Step 14. Adjustment of Distortion
Step 15. Resetting Optical Pickup Head

Confirmation of Laser Output (Step 1)

① Do not set the CD cartridge.
② Turn ON the DC power supply.
③ Apply the laser power meter's sensor to the optical pick up head's as shown in Fig. B.
④ Press the reset button and measure the laser output within a short time.

Rating: Laser output = 0.1mW to 0.12mW

⑤ Do not press the "Reset Button" at unnecessarily because of prevention unnecesary radiation of Laser.

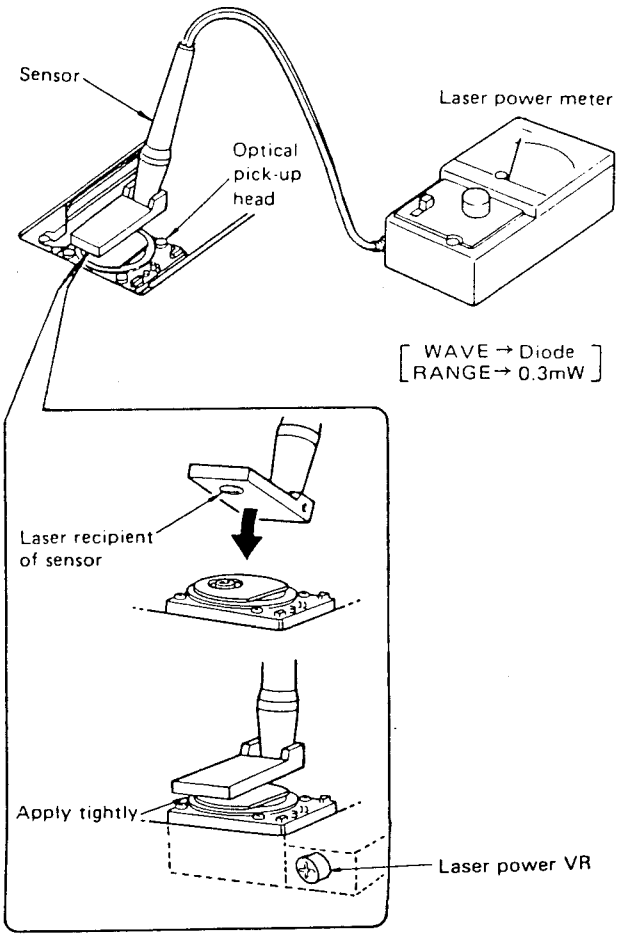


Fig. B

Precautions in handling optical pick-up head

(1) No soldering necessary for CDC7000.
(2) Since laser light is near-infrared, visual confirmation is difficult. While light is emitted, for safety make sure your eyes are at least 30 cm away from the objective lens.
(3) Do not disassemble it.
(4) Do not drop or apply shock to it.
(5) Do not leave it under high temperature or humidity.
(6) Do not touch the objective lens. Should there be dirt on the lens, clean using a blower for cameras.
(7) Do not adjustment the VR, it is provided for production.

Adjustment of Focus Offset (Step 2)

Oscilloscope (1) settings

- DC coupling
- 0.5 V/div range (Vertical)
  (50 mV/div when 10:1 probe is used)
- 1 to 20 msec/div time (Horizontal)

① Do not set the CD cartridge.
② Insert a resistor (4.7kΩ) between DC and REM.
③ Connect the oscilloscope (1) to FDO and GND terminals on the input side of the filter.
④ Turn ON the DC power supply.
⑤ Adjust VR005 (FOCUS OFFSET) so that the FDO level is DC 0V.

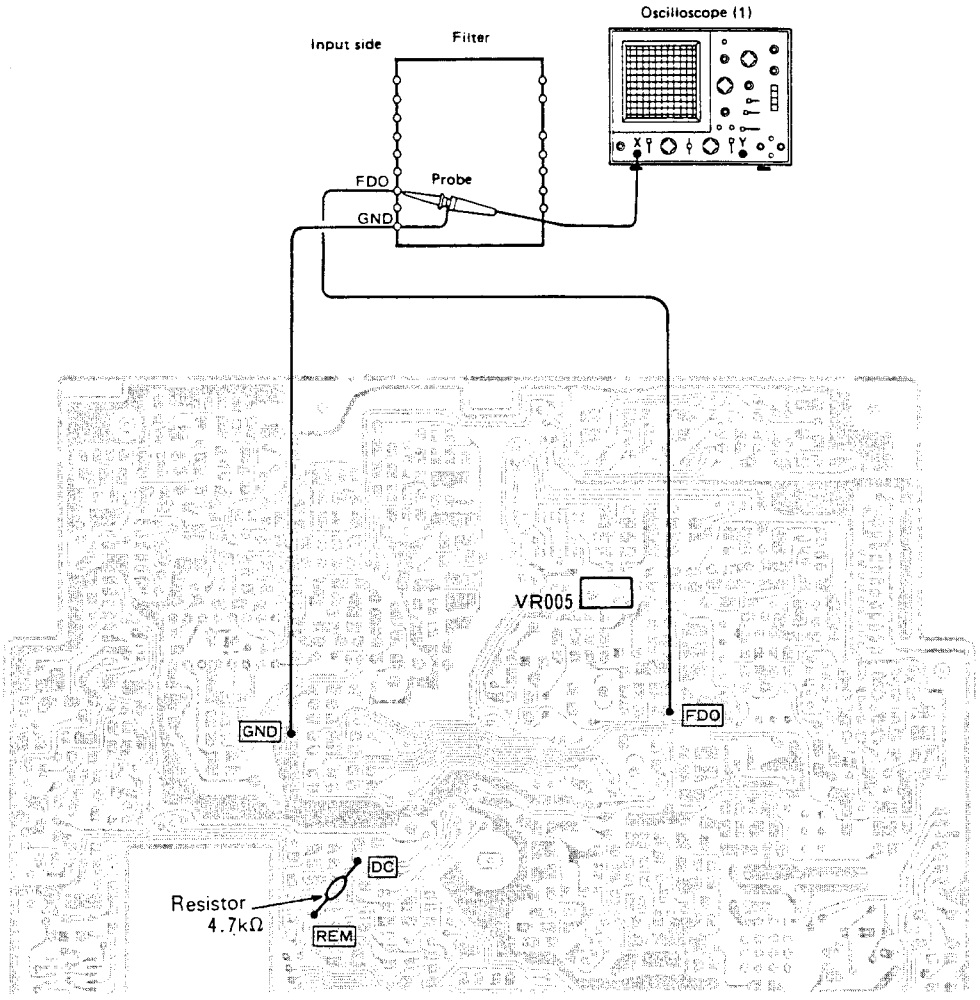


Fig. C

Adjustment of Tracking Offset (Step 3)

Oscilloscope (1) settings

- DC coupling
- 50mV/div range (Vertical)
  (5mV/div when 10:1 probe is used)
- 10 msec/div time (Horizontal)

① Connect the filter and measuring instruments, as shown in Fig. D.

② Insert a resistor (4.7kΩ) between DC and REM.
③ Set SW4 to ON.
④ Turn ON the DC power supply.
⑤ While observing the indication (ETDO) of the DC voltmeter, adjust VR001 (TRACKING OFFSET) so that it satisfies the rating.
Rating: ETDO = 0 ± 50 mVDC

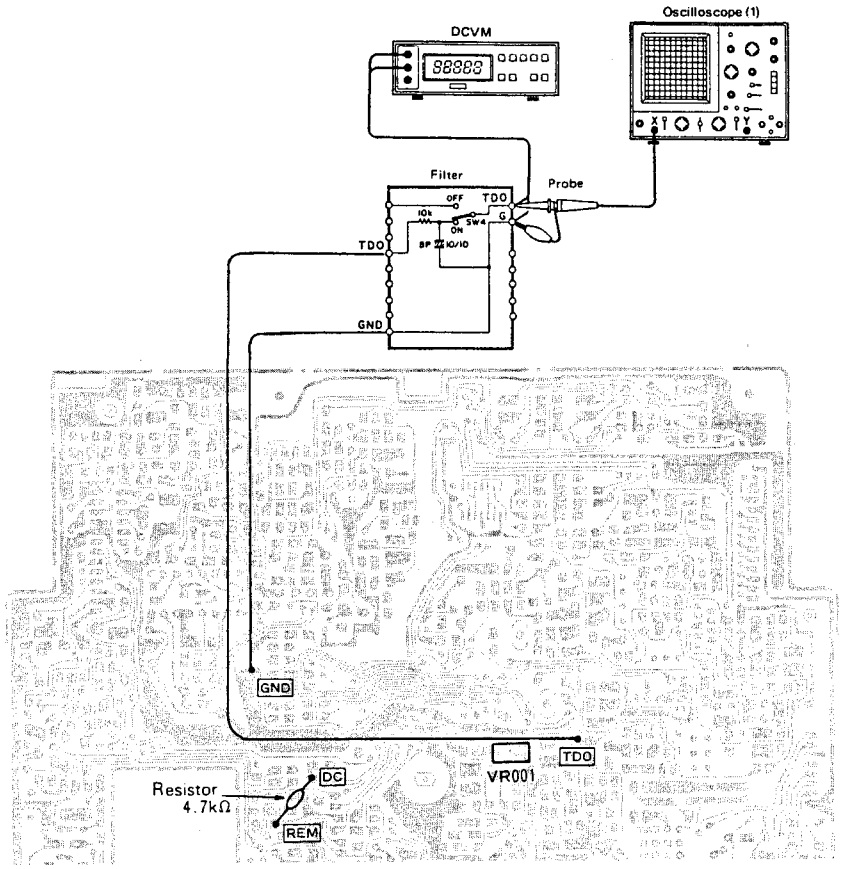


Fig. D

Confirmation of Focus Actuator Operation (Step 4)

Oscilloscope (1) settings

- DC coupling
- 1V/div range (Vertical)
  (0.1V/div when 10:1 probe is used)
- 0.5 sec/div or 1 msec/div time (Horizontal)

① Do not set the CD cartridge.

② Connect the oscilloscope (1) to FDO and GND terminals on the input side of the filter.

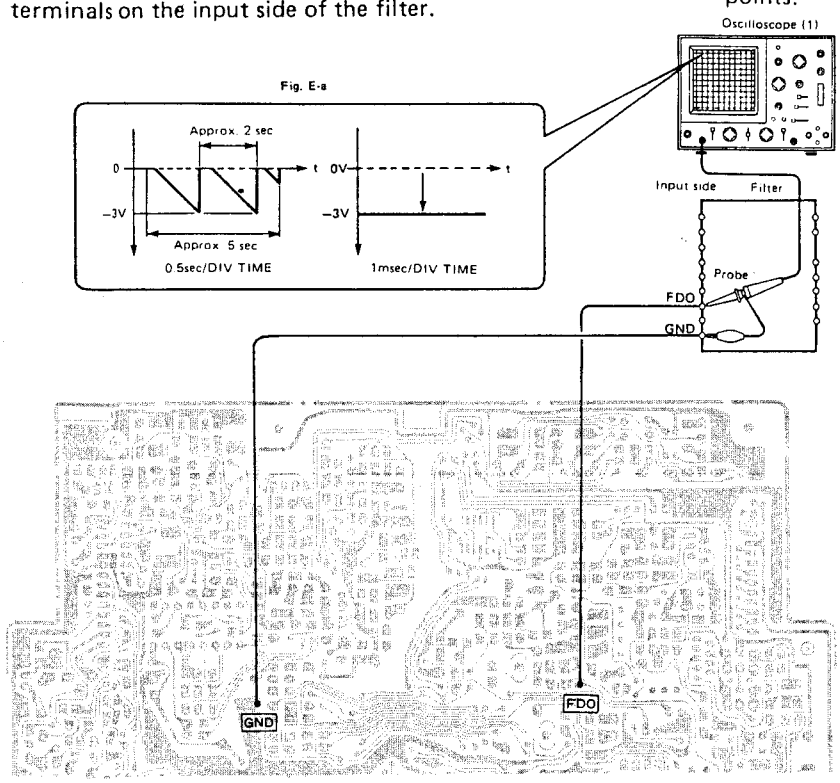
③ Turn ON the DC power supply.

④ Push the Slide Outsert backward as shown in Fig. E-a and set to the FOCUS search mode.

⑤ During 5 seconds of FOCUS search, confirm that the waveform is as shown in Fig. E-b.

⑥ Confirm that the optical pick-up head's objective lens moves smoothly between the lowest and highest points.

Fig. E-a



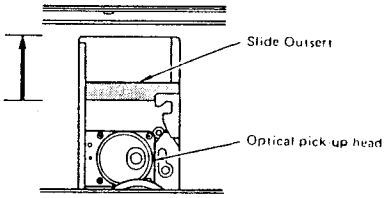


Fig. E-b

Adjustment of VCO (Step 5)

① Short-circuit between [EFMI] and [GND], Insert a resistor (4.7kΩ) between [DC] and [REM], connect the measuring instruments as shown in Fig. F.

② Do not set the CD cartridge.

④ While observing the frequency counter indication (Fvco), adjust L201 so that it satisfies the rating.

Rating: Fvco = 4.3218 MHz ± 10 kHz

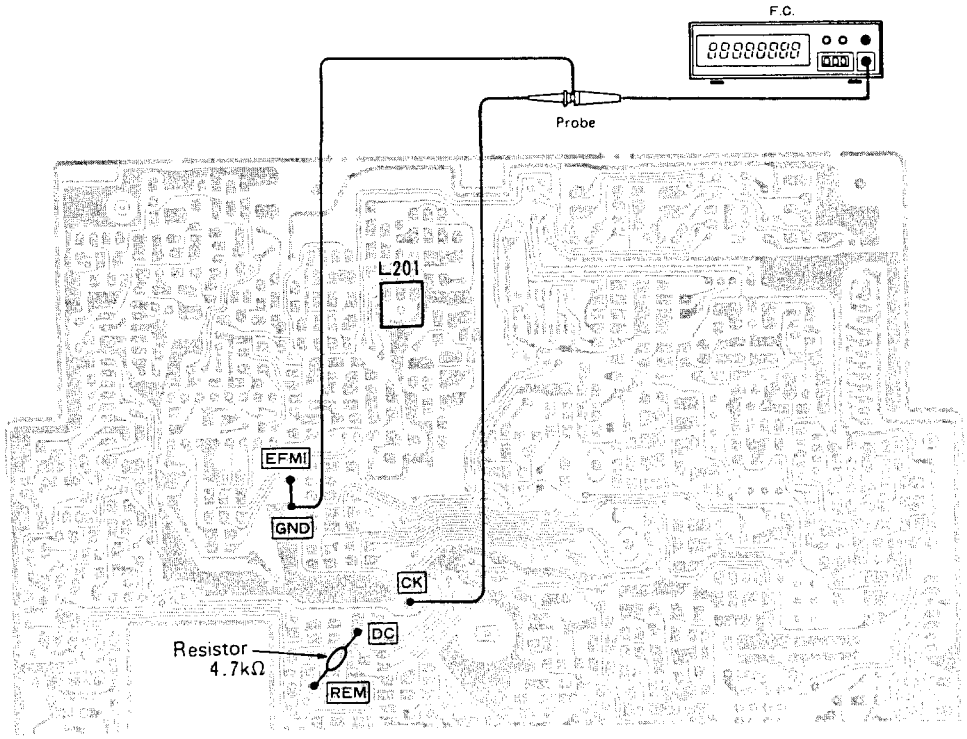


Fig. F

Confirmation of Jitter (Step 6)

Oscilloscope (2) Settings

- AC coupling
- 0.5 V/div range (Vertical)
  (50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μsec/div time (Horizontal)

① Connect oscilloscope (2) to [HF] terminal, as shown in Fig. G.

② Turn ON the DC power supply.

③ Set the cartridge with test disc YEDS-18 or Philips test disc inserted.

④ Confirm that [HF] (eye-pattern) signal appears on oscilloscope (2).

* Confirm at the center of the disc.

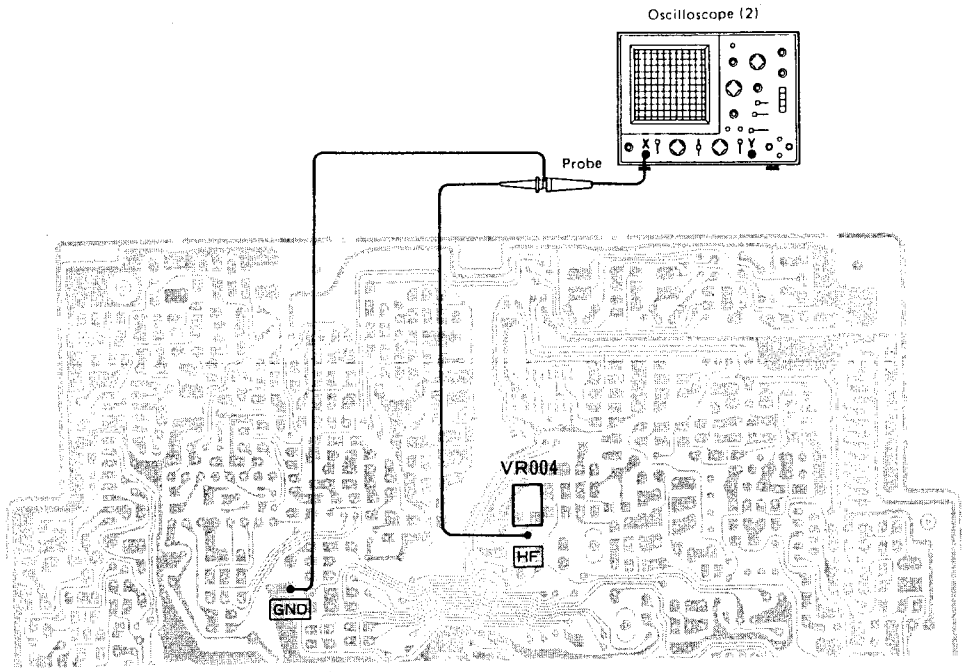


Fig. G

Adjustment of Diffraction Grating (Step 7)

* This adjustment requires use of 2 oscilloscopes.

* Power should not be turned OFF during steps ② through ⑨

Oscilloscope (1) setting conditions

- DC coupling
- 0.1V/div range (Vertical)
  (10mV/div when 10:1 probe is used)
- 5 to 20 msec/div time (Horizontal)

Oscilloscope (2) setting conditions

- AC coupling
- 0.5 V/div range (Vertical)
  (50mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μsec/div time (Horizontal)

Oscilloscope (2), should have frequency response of 50 MHz or greater.

① Connect the filter and measuring instruments, as shown in Fig. H.

1) Connect oscilloscope (1) to the [TE] termin
2) Connect oscilloscope (2) to the [HF] terminal.

② Set SW4 to OFF

③ Turn ON the DC power supply.

④ Set the cartridge with test disc YEDS-18 or Philips test disc inserted.

⑤ Set SW1 in the filter to ON.

[Short-circuit [TOF] terminal and [GND] terminal: TRACKING SERVO → OFF.]

⑥ Observe waveform on oscilloscope (1).

⑦ Adjust diffrection grating for maximum signal amplitude [TE] at oscilloscope (1).

* Adjust while pressing the stabilizer with a finger so as to prevent fast-forwarding.
Or repeat turning the servo ON and OFF with the TRACKING SERVO OFF time within 3 to 4 seconds.

* Adjust at the inner circumference of the disc.

⑧ Set SW1 of the filter to OFF.
(Open the [TOF] and [GND] terminals: TRACKING SERVO → ON)

⑨ Confirm that [HF] (eye-pattern) signal appears on oscilloscope (2).

* Set to the point where [TE] and [HF] signal amplitude is maximum and [HF] (eye-pattern) signal can be observed finely and clearly.

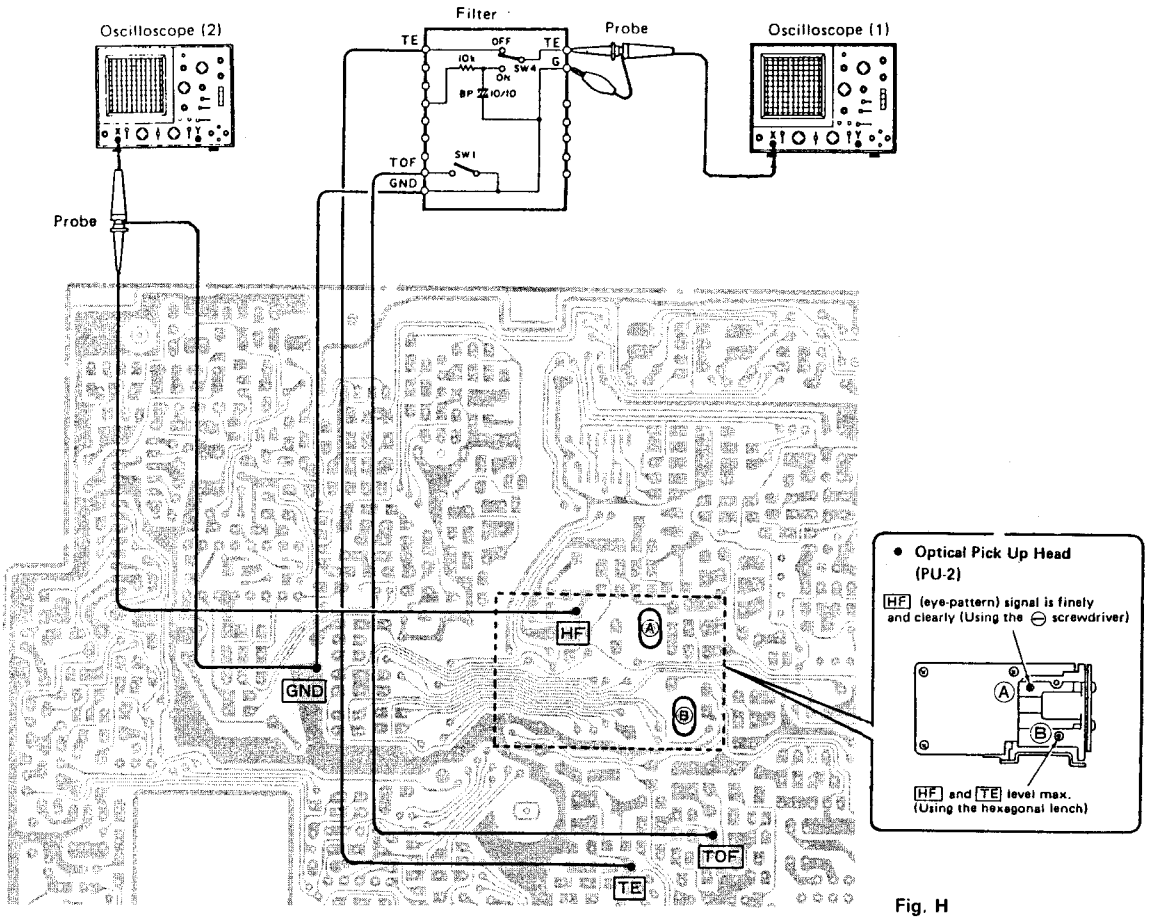
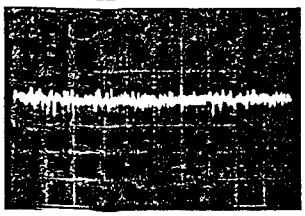


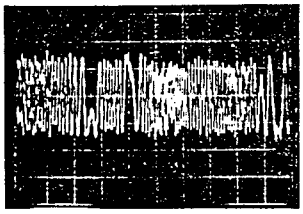
Fig. H

Oscilloscope (1)

TRACKING SERVO ON



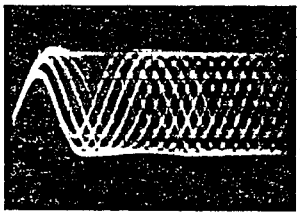
TRACKING SERVO OFF



Maximum signal amplitude [TE]

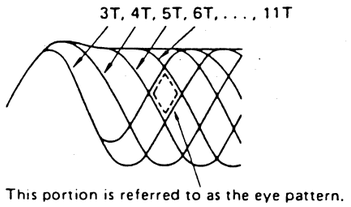
Oscilloscope (2)

Eye pattern



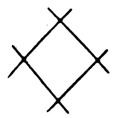
0.5V/DIV (Vertical)
0.5μsec/DIV TIME (Horizontal)

Waveforms 3T – 11T.

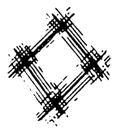


The abnormal eye pattern has less distinct lines and smaller amplitude than that to the good waveform.

Good waveform



Abnormal waveform



Adjust so that the good waveform is obtained.

Adjustment of EF Balance (Step 8)

* Power should not be turned OFF during steps ② through ⑦ .

Oscilloscope (1) settings

- DC coupling
- 0.1 V/div range (Vertical)
  (10 mV/div when 10:1 probe is used)
- 1 to 20 msec/div time (Horizontal)

① Connect the filter and measuring instruments, as shown in Fig. I.
② Set SW4 to OFF
③ Turn ON the DC power supply.
④ Set the CD cartridge with test disc YEDS-18 or Philips test disc inserted. (while playing TRACK 1)
⑤ Set SW1 in the filter to ON. (TRACKING SERVO OFF)
⑥ Observe the waveform on oscilloscope (1).
⑦ Adjust VR003 (EF BALANCE) so that the amplitude of [TE] signal becomes equal above and below DC 0V position.
* Adjust at the inner circumference of the disc.
⑧ Set SW1 in the filter to OFF.

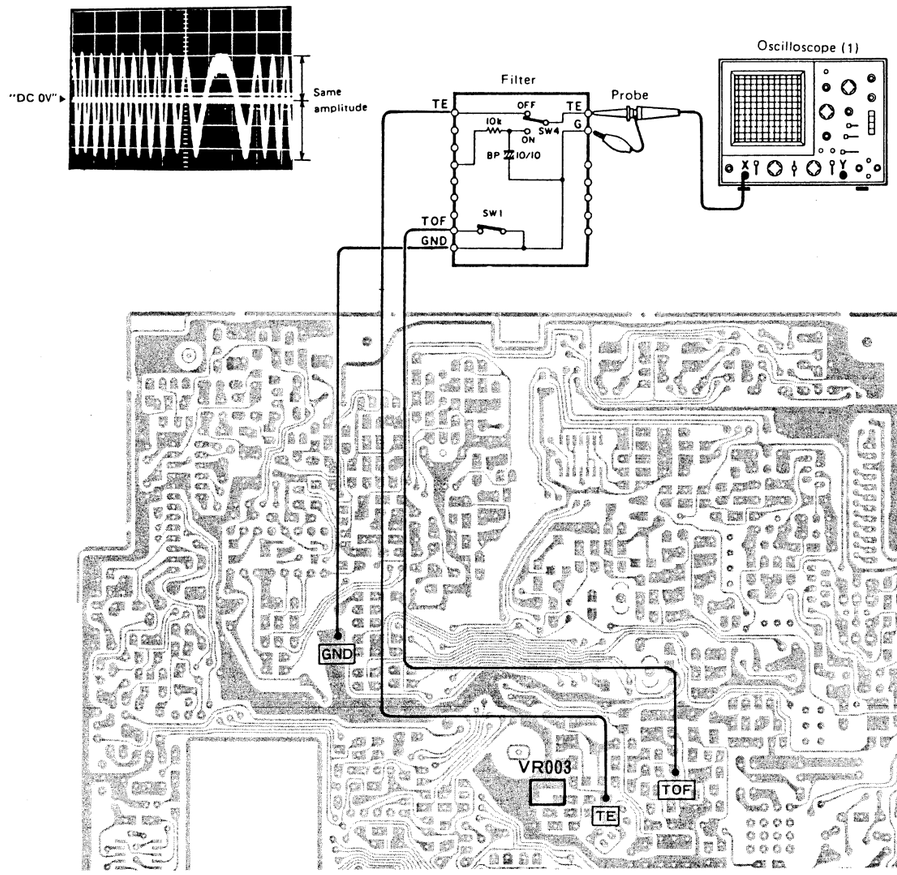


Fig. I

Adjustment of HF Level (Step 9)

Oscilloscope (2) settings

- AC coupling
- 0.5 V/div range (Vertical)
  (50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μsec/div time (Horizontal)

① Connect oscilloscope (2) to [HF] terminal (Same as step 6).
② Turn ON the DC power supply.
③ Set the CD cartridge with test disc YEDS-18 or Philips test disc inserted.
④ Adjust VR004 (HF GAIN) so that the [HF] signal waveform is 2.0 Vp-p.
* Adjust at the center of the disc.
Rating: E_{HF} = 2.0 Vp-p

Adjustment of Focus Gain (Step 10)

* This adjustment requires use of two single channel AC voltmeter or one dual channel AC voltmeter.

① Connect the filter and measuring instruments, as shown in Fig. J.
Apply an 1kHz, 4.5 Vrms signal from the AF oscillator to [FDI] terminal via the resistor (470kΩ) in the filter.
② Set SW3 to OFF.
③ Set SW2 to F (FOCUS).
④ Turn ON the DC power supply.
⑤ Set the CD cartridge with test disc YEDS-18 or Philips test disc inserted. (While playing TRACK 1)
⑥ Set SW3 to ON.
⑦ Read the indications of the AC voltmeters (CH1: E_{FPO}, CH2: E_{FDO}), adjust VR006 (FOCUS GAIN) so that they satisfy the rating.

Rating: $E_{FDO} - E_{FPO} = -8$dB

Example [0dBV = 1V]
E_{FPO} = −24.8dBV (57.5mV)
E_{FDO} = −16.8dBV (144mV)

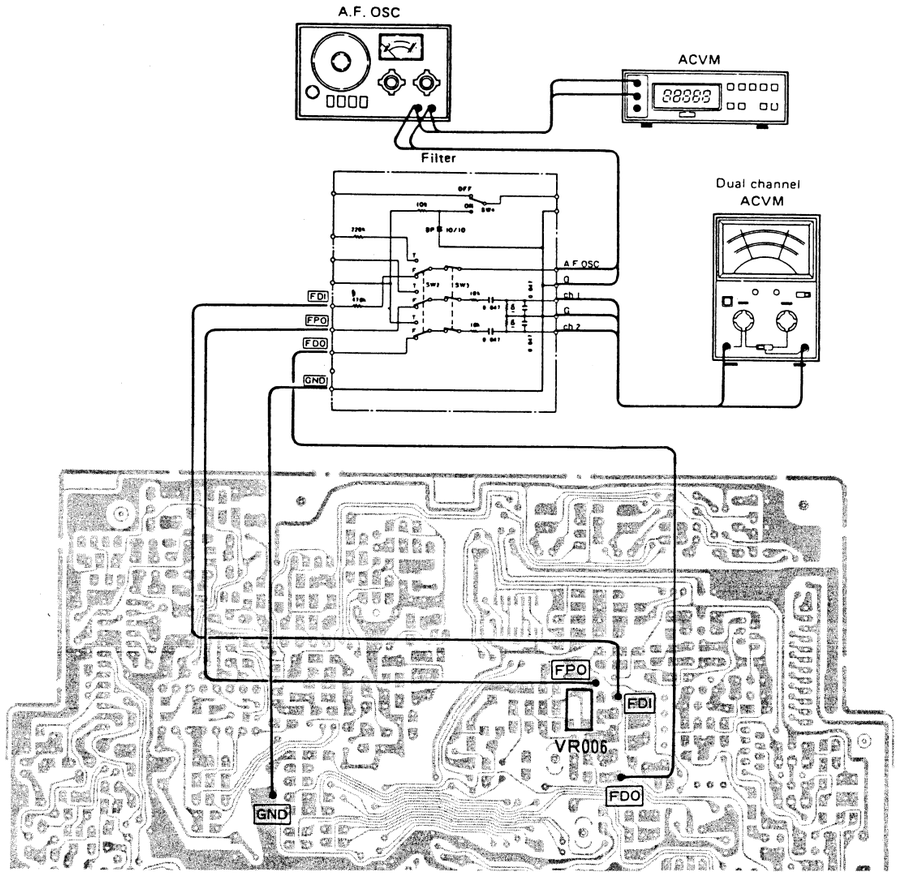


Fig. J

Adjustment of Tracking Gain (Step 11)

* This adjustment requires use of two signal channel AC voltmeter or one dual channel AC voltmeter.

① Connect the filter and measuring instruments, as shown in Fig. K.
Apply a 1kHz, 100 mVrms signal from the AF oscillator to TDI terminal via the resistor (220kΩ) in the filter.
② Set SW3 to ON.
③ Set SW2 to T (TRACKING).
④ Turn ON the DC power supply.
⑤ Set the CD cartridge with test disc YEDS-18 or Philips test disc inserted. (While playing TRACK 1)
⑥ While observing the indications of the AC voltmeters (CH1: ETPO, CH2: ETDO), adjust VR002 (TRACKING GAIN) so that they satisfy the rating.
Rating: ETPO – ETDO = 11dB±1dB

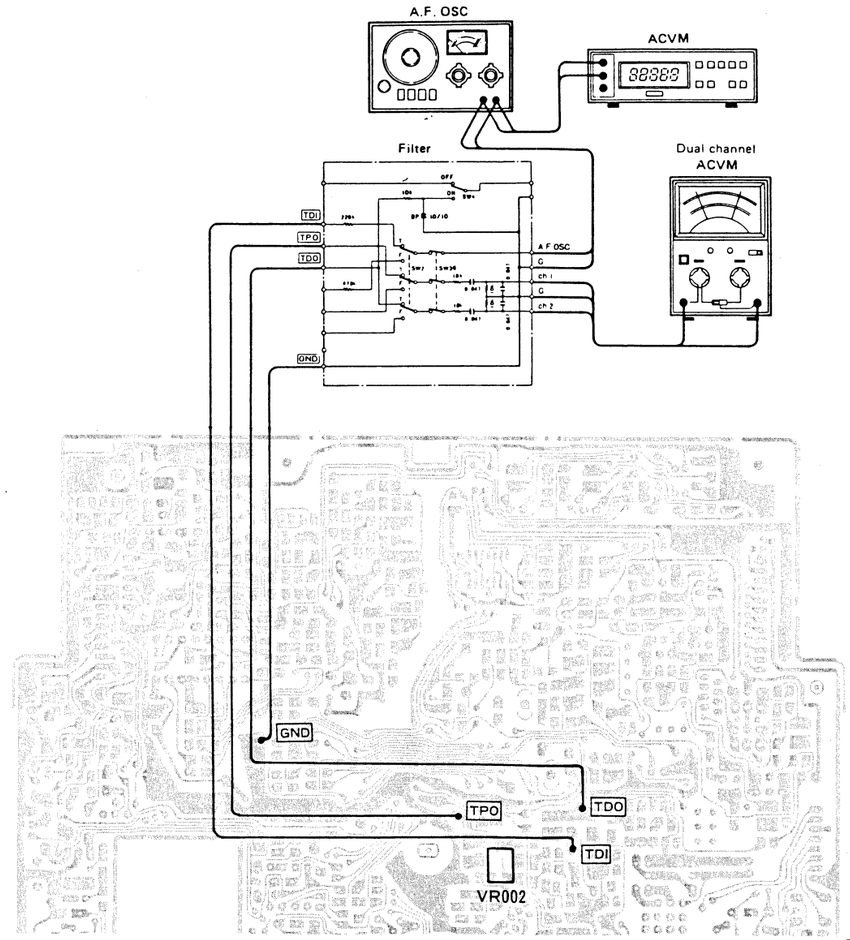


Fig. K

Confirmation of Kick Gain (Step 12)

Oscilloscope (1) (2-ch oscilloscope) Settings

- DC coupling
- CH1 → TE terminal 0.1 V/div (Vertical)
  (10 mV/div when 10:1 probe is used)
- CH2 → TH terminal (IC001, pin 4): 5 V/Div (Vertical)
  (0.5 V/div when 10:1 probe is used)
- TRIGGER MODE: 2 CH
- 0.2 msec/div time (Horizontal)

① Connect the measuring instruments, as shown in Fig. L.
② Turn ON the DC power supply.
③ Set the CD cartridge with the disc.
④ Observe waveform while pressing Fast Forward mode key (▶▶) for 3 seconds.
⑤ Confirm that TE signal cycle is between 0.7 and 2.3 when TH signal level is High.
⑥ Press Reverse mode key (◀◀) for 3 seconds and confirm that TE signal cycle is within the above specification but in reverse phase.

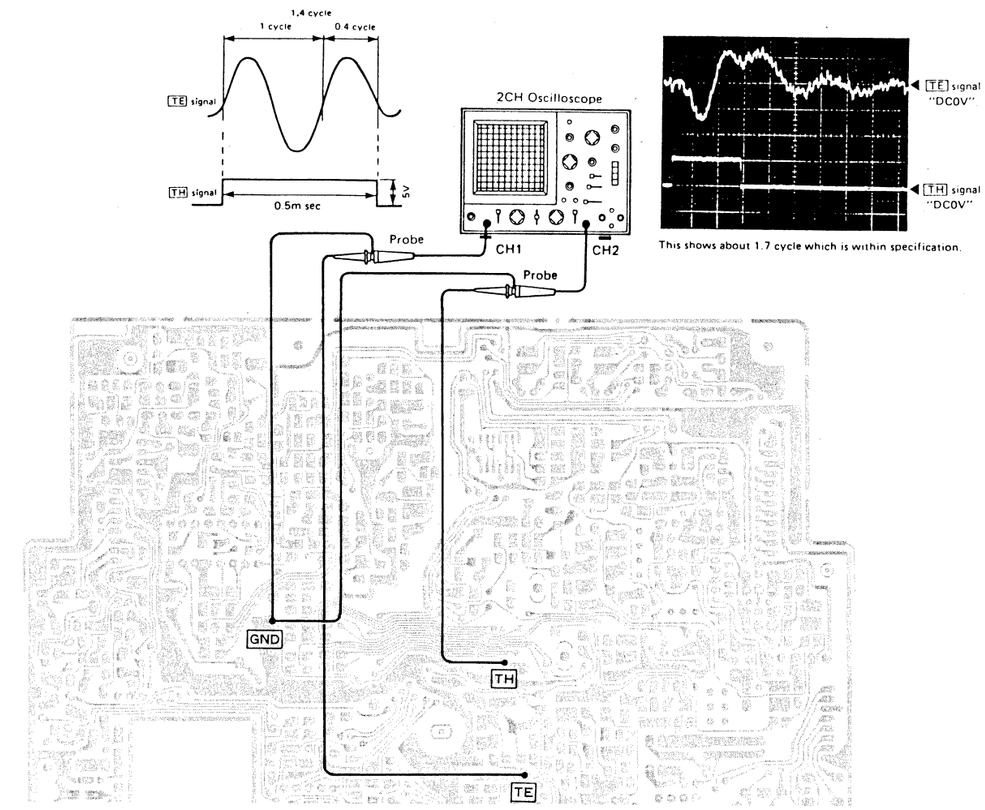


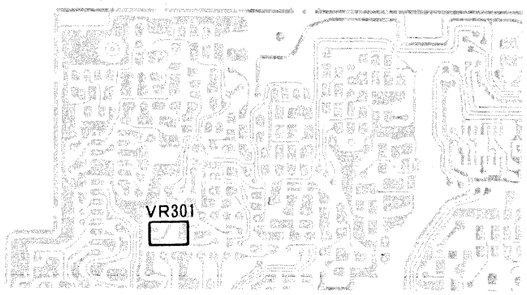
Fig. L

Confirmation of Search (◀◀ , ▶▶) Operation (Step 13)

① Turn ON the DC power supply.
② Set the CD cartridge with the disc.
③ Press Fast Forward mode key (▶▶) and confirm that the displayed time (ELAPSED TIME) advances smoothly.
④ Press Reverse mode key (◀◀) and confirm as in step ③

Adjustment of Distortion (Step 14)

① Turn ON the DC power supply.
② Set the cartridge with test disc YEDS-18 or Philips test disc inserted.
③ Play back the disc of 0dB, 1kHz and adjust VR301 so that distortion is minimum.



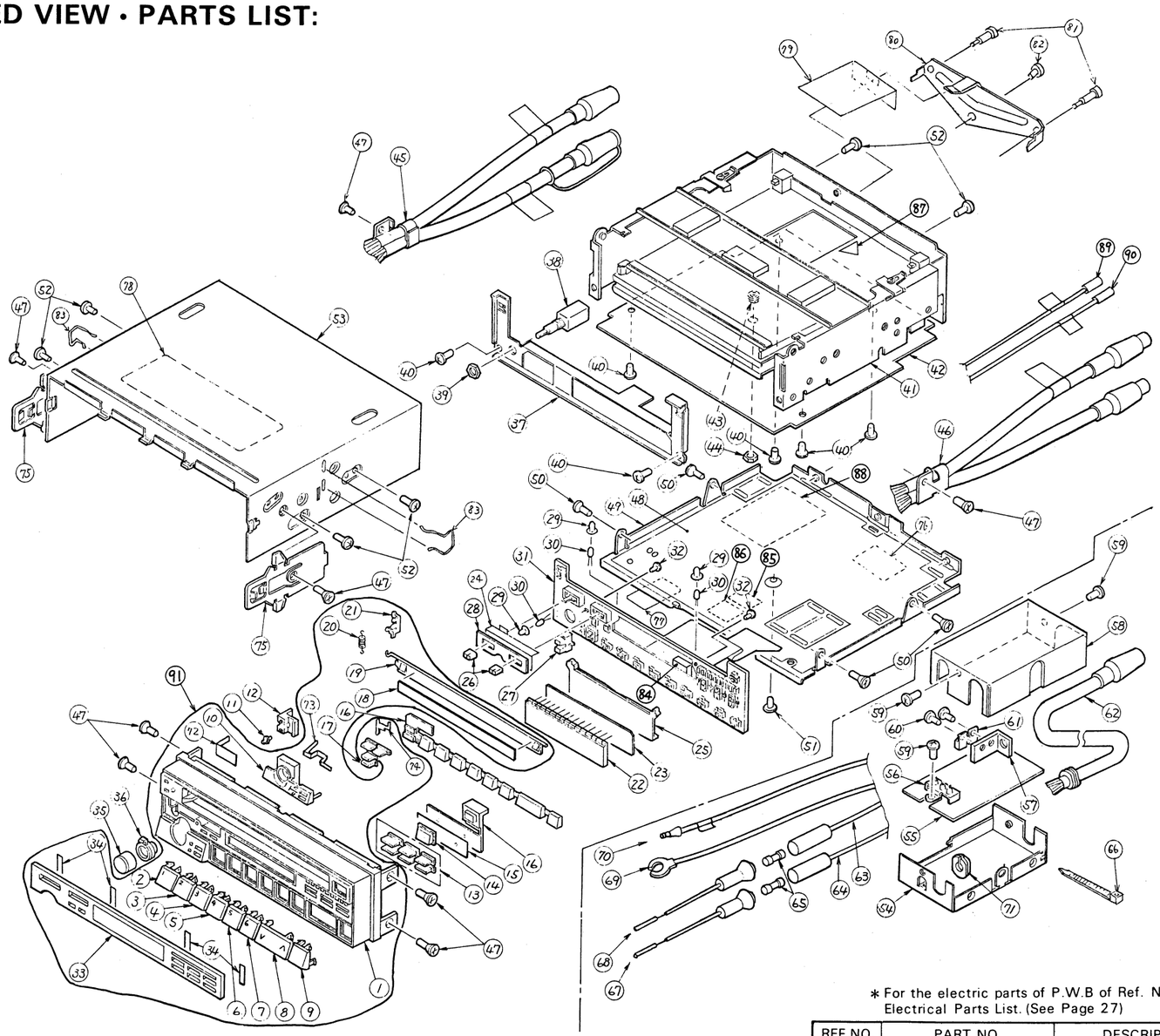
Resetting Optical Pickup Head (Step 15)

Upon completion of adjustment and reassembly, press the reset switch (S921). Then the optical pickup head returns to its specified position. Neglecting this step will cause damage to the optical pickup head during transportation.

* As it takes some time before the optical pickup head returns, be sure not to turn off the power for about five seconds after pressing the reset switch.

■EXPLODED VIEW • PARTS LIST:

◎Main section



REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	370-4074-02	Escutcheon	1
2	382-1465-00	Button (1)	1
3	382-1466-00	Button (2)	1
4	382-1467-00	Button (3/FB)	1
5	382-1468-00	Button (4/FF)	1
6	382-1460-00	Button (5/RPT)	1
7	382-1461-00	Button (6/SCN)	1
8	382-1463-00	Button (◀◀ ▶▶)	1
9	382-1462-00	Button (■▶)	1
10	335-2703-00	Reflector	1
11	382-1469-00	Button (RESET)	1
12	335-2704-00	Reflector	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
13	382-1421-00	Button	6
14	382-1471-00	Button (EJECT)	1
15	347-2453-00	Film	1
16	345-4603-01	Rubber button	1
17	382-1464-00	Button	4
18	378-0110-02	Badge	1
19	320-0417-00	Dustproof cover	1
20	750-2674-00	Spring	1
21	330-8719-00	Doar lock	1
22	379-0197-00	Indicator (LCD)	1
23	347-2454-00	Film	1
24	347-2662-00	Conductor	1

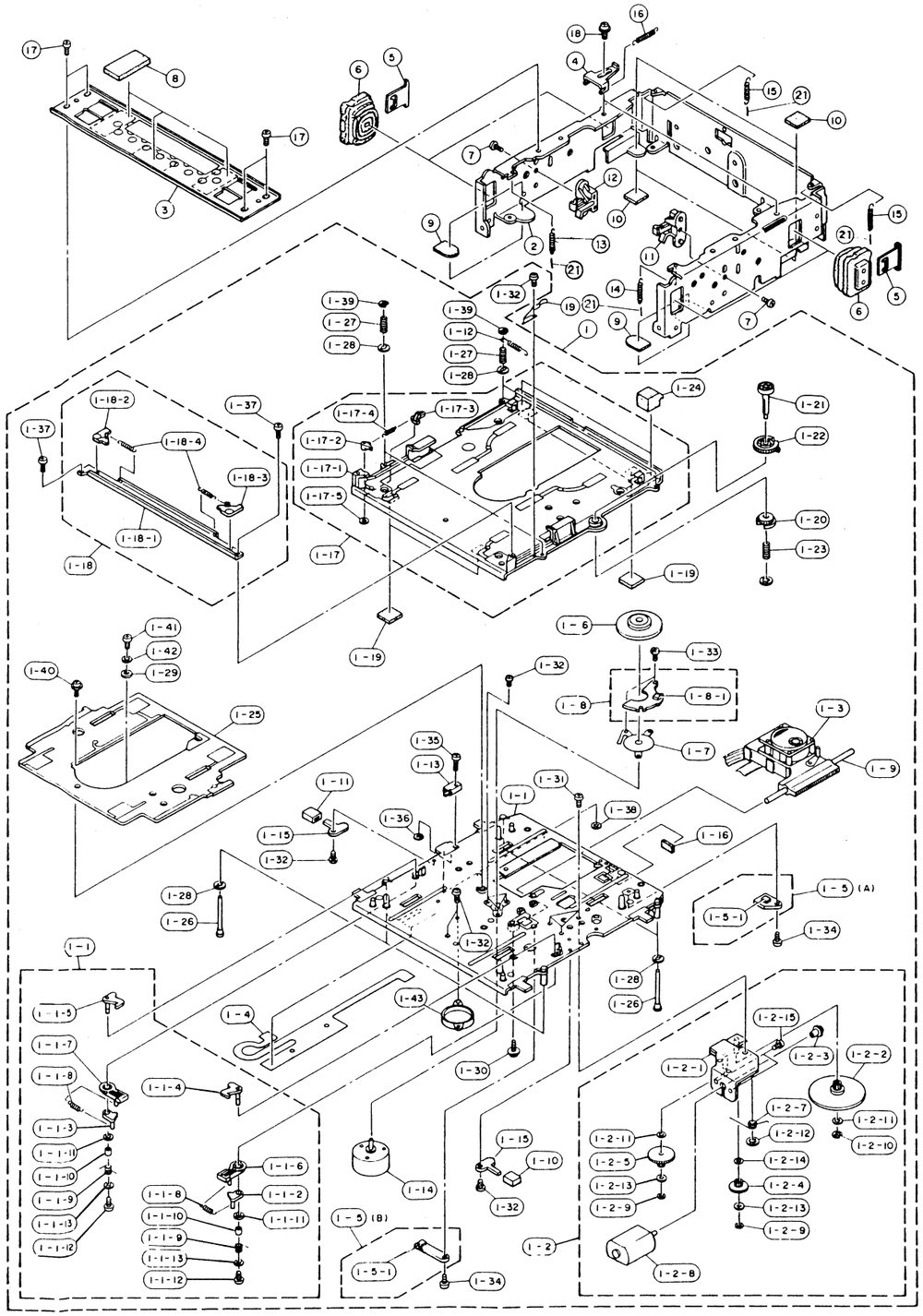
REF.NO.	PART NO.	DESCRIPTION	Q'TY
25	335-2705-00	Reflector	1
26	380-4932-00	Knob (SLIDE)	2
27	335-2711-00	LED holder	1
28	347-2499-00	Shade film	1
29	345-4441-01	P.L. cap	3
30	017-0337-06	Pilot lamp (8V)	3
* 31	099-8279-00	P.W.B (SW-P.W.B-A)	1
32	702-2006-81	Tap screw (2x6)	2
33	373-0513-01	Dial cover	1
34	347-2666-00	Double face	4
35	380-4933-00	Knob (VOL)	1
36	380-4934-00	Knob (FAD)	1
37	309-0573-00	Front plate	1
38	012-4692-00	Variable resistor (SW/VOL)	1

* For the electric parts of P.W.B of Ref. No. 31, refer to the Electrical Parts List. (See Page 27)

REF.NO.	PART NO.	DESCRIPTION	Q'TY
39	722-0282-00	Nut (M7)	1
40	714-2605-81	Machine screw (M2.6x5) (Front plate)	6
41	929-0502-00	CD mechanism	1
42	099-8278-01	Main P.W.B	1
43	716-0783-00	P.W.B screw	1
44	722-0511-00	P.W.B nut	1
45	854-0360-00	Extension lead (TU/ACC)	1
46	854-0359-00	Extension lead (AMP/DD)	1
47	714-3006-41	Machine screw (M3x6)	8
48	347-2661-00	Insulator sheet(Lower)	1
49	311-1286-00	Lower case	1
50	714-2606-41	Machine screw (M2.6x6)	4
51	714-2005-81	Machine screw (M2x5)	1
52	714-3004-80	Machine screw (M3x6)	6
53	310-1329-00	Upper case	1
54	311-1208-01	Lower case	1
55	099-8280-00	P.W.B	1
56	944-0714-00	Filter ass'y	1
57	330-8762-00	Heat sink	1
58	310-1245-00	Upper case	1
59	731-3005-80	Tap tight (M3x5)	3
60	714-3006-80	Machine screw (M3x6)	2
61	051-0624-00	IC	2
62	854-0358-00	Extension lead	1
63	850-2458-00	A-lead (ACC)	1
64	850-2389-00	A-lead (B-UP)	1
65	120-0030-00	Fuse (3A)	2
66	335-0833-01	Clamp	1
67	850-2415-00	A-lead (B-UP)	1
68	850-2414-00	A-lead (ACC)	1
69	840-0468-00	Bonding wire	1
70	850-2410-00	A-lead (ILLUMI.)	1
71	335-2706-00	Bush	1
72	347-2665-00	Conductor	1
73	347-2663-00	Conductor	1
74	347-2664-00	Conductor	1
75	750-2671-00	Bracket spring	2
76	286-6970-00	Set plate	1
77	285-1339-00	Guide label (VF LEVEL)	1
78	285-1340-00	Guide label	1
79	285-1318-00	Guide label	1
80	330-8825-00	Protector bracket	1
81	716-0784-00	Protector screw	2
82	714-4006-19	Machine screw (M4x6)	1
83	341-1375-00	Lock pin	2
84	345-4438-00	Spacer	1
85	285-1352-00	Guide label	1
86	285-1328-00	Guide label	1
87	285-1327-00	Guide label	1
88	285-0915-00	Guide label	1
89	850-2396-00	A-lead (AUTO-ANT)	1
90	852-9708-00	Extension lead (SEEK)	1
91	940-0932A	Escutcheon ass'y	1

■EXPLODED VIEW:

◎Disc mechanism section



■PARTS LIST:

◎Disc mechanism section

REF.NO.	PART NO.	DESCRIPTION	Q'TY
	———	Mechanism unit	1
1	653-0066-02	Disc mechanism unit	1
1-1	653-0066-03	Main outsert ass'y	1
1-1-1	653-0066-04	Main outsert	1
1-1-2	653-0066-05	Ring, L	1
1-1-3	653-0066-06	Ring, R	1
1-1-4	653-0066-07	Cam, L	1
1-1-5	653-0066-08	Cam, R	1
1-1-6	653-0066-09	Lever, L	1
1-1-7	653-0066-10	Lever, R	1
1-1-8	653-0066-11	Spring	1
1-1-9	653-0066-12	Spring	1
1-1-10	653-0066-13	Bush	1
1-1-11	653-0066-14	Plain washer (ϕ3)	1
1-1-12	653-0066-15	Pan head tapping screw (1.4x4 ZMC2-Y)	1
1-1-13	653-0066-16	Push nut (SPN1.5)	1
1-2	653-0066-17	Gear ass'y	1
1-2-1	653-0066-18	Base ass'y	1
1-2-2	653-0066-19	Gear, Pinion	1
1-2-3	653-0066-20	Gear, SB	1
1-2-4	653-0066-21	Gear, LB	1
1-2-5	653-0066-22	Gear, MID	1
1-2-6	653-0066-23	Spring	1
1-2-7	653-0066-24	Spring	1
1-2-8	653-0066-25	Motor, Feed	1
1-2-9	653-0066-26	Washer (t0.25xϕ1.6xϕ4)	1
1-2-10	653-0066-27	E-Ring (ϕ1.5)	1
1-2-11	653-0066-28	Washer (t0.13xϕ2.1xϕ4)	1
1-2-12	653-0051-76	CS stopper ring (ϕ3)	1
1-2-13	653-0066-29	Washer	1
1-2-14	653-0066-30	Washer (t0.25xϕ2.1xϕ7)	1
1-2-15	653-0066-31	Binding head screw (2x3 ZMC2-Y)	1
1-3	653-0066-32	Optical pick up head (PU-2C)	1
1-4	653-0066-33	Connector circuit board	1
1-5	653-0066-34	Interlapter circuit board	1
1-5-1	653-0066-35	Photo interlapter	1
1-6	653-0066-36	Disc table ass'y 2	1
1-7	653-0066-37	Outer pole ass'y 2	1
1-8	653-0066-38	Encoder circuit board	1
1-8-1	653-0066-39	Photo interlapter	1
1-9	653-0066-40	Rod (ϕ4)	1
1-10	653-0066-41	Front stopper, L	1
1-11	653-0066-42	Front stopper, R	1
1-12	653-0066-43	Spring	1
1-13	653-0066-44	Slide switch	1
1-14	653-0066-45	Motor, Drive	1
1-15	653-0066-46	Front damper	1
1-16	653-0066-47	Spacer	1
1-17	653-0066-48	Holder outsert ass'y	1
1-17-1	653-0066-49	Holder outsert	1
1-17-2	653-0066-50	Lever	1
1-17-3	653-0066-51	Lever	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
1-17-4	653-0066-52	Spring	1
1-17-5	653-0051-56	CS stopper ring (ϕ2 ZMC2-Y)	1
1-18	653-0066-53	Support ass'y 2	1
1-18-1	653-0066-54	Support	1
1-18-2	653-0051-78	Stopper, L	1
1-18-3	653-0051-79	Stopper, R	1
1-18-4	653-0051-80	Spring	1
1-19	653-0066-55	Magnet, Clamp	4
1-20	653-0066-56	Gear, Loading C	1
1-21	653-0066-57	Pin, Gear	1
1-22	653-0066-58	Gear, Slide	1
1-23	653-0066-59	Spring	1
1-24	653-0066-60	Stopper, Rubber	2
1-25	653-0066-61	Slide outsert	1
1-26	653-0066-62	Shaft, Clamp	1
1-27	653-0066-63	Spring	1
1-28	653-0066-64	Ring	1
1-29	653-0051-86	Washer	1
1-30	653-0066-65	BW head tapping screw (3x8 ZMC2-Y)	1
1-31	653-0066-66	Binding head screw (2x5 ZMC2-BI)	1
1-32	653-0066-31	Binding head screw (2x3 ZMC2-Y)	1
1-33	653-0066-67	Binding head P-tight screw (2x4 ZMC2-BI)	1
1-34	653-0066-68	Binding head P-tight screw (3x6 ZMC2-Y)	1
1-35	653-0066-69	Binding head P-tight screw (2x8 ZMC2-Y)	1
1-36	653-0066-70	Plain washer (ϕ2 ZMC2-Y)	1
1-37	653-0066-71	Pan head tapping screw (2x6 ZMC2-Y)	1
1-38	653-0051-76	CS stopper ring (ϕ3)	1
1-39	653-0066-27	E-ring (ϕ1.5)	1
1-40	653-0051-85	BW head tapping screw (3x6 ZMC2-Y)	1
1-41	653-0066-72	Pan head screw (3x3 ZMC2-Y)	1
1-42	653-0066-14	Plain washer (ϕ3 ZMC2-Y)	1
1-43	653-0066-73	Senser	1
2	653-0066-74	Chassis	1
3	653-0066-75	Sub chassis	1
4	653-0066-76	Support adjuster	2
5	653-0066-77	Support damper	4
6	653-0066-78	Damper	4
7	653-0066-79	Binding head tapping screw (2.6x5 FCRM3-BI)	2
8	653-0066-80	Pad	3
9	653-0066-81	Spacer, A	4
10	653-0066-82	Spacer, B	4
11	653-0066-83	Holder, L	1
12	653-0066-84	Holder, R	1
13	653-0066-85	Spring, FL	1
14	653-0066-86	Spring, FR	1
15	653-0066-87	Spring, BR	2
16	653-0066-88	Spring, BAL	2
17	653-0066-89	Binding head screw (2.6x6 FCRM3-BI)	4
18	653-0066-90	Cup screw (3x6 FCRM3-BI)	4
19	653-0066-93	Spring	1
21	653-0066-91	Damper spring	4

■PARTS LIST:

◎Electrical section

◎MAIN P.W.B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
D001,002 401~405 701~721 725,802,803	001-0330-00	Diode 1SS119	31
D301~304	001-0366-00	Diode LTZMR15	4
D407~409	001-0377-32	Diode MA4056	3
D406,801	001-0377-36	Diode MA4062	2
D201~204	001-0423-18	Diode MA4051	4
D003	001-0425-11	Diode HZS2.7E	1
V201	001-0469-00	Diode SVC211SPA	1
T601	002-0184-00	Thermistor 25R-30K	1
L201	010-2161-00	Coil 3.3μH	1
VR301	012-4711-00	Variable resistor 470Ω-B	1
VR001,004 005,307	012-4711-01	Variable resistor 10kΩ-B	4
VR002,003 006	012-4711-03	Variable resistor 100kΩ-B	3
R142	032-0091-00	Film chip resistor 1/16W4.7MΩ	1
R113,114 117~120 126~129	032-0092-00	Film chip resistor 1/16W10kΩ	10
C407	042-0174-00	Electrolytic capacitor 16V4.7μF TAN	1
C107,108,201 205	043-0227-50	Ceramic chip capacitor 0.056μF	4
C015,310,315	043-0227-51	Ceramic chip capacitor 0.068μF	3
C109	043-0227-52	Ceramic chip capacitor 0.082μF	1
C016,017,034 214,219,301 304,335,336 340,343,352 404,411,413 416,418,420 604,703	043-0227-53	Ceramic chip capacitor 0.1μF	20
C009	043-0228-50	Ceramic chip capacitor 0.15μF	1
C004~007	043-0228-51	Ceramic chip capacitor 0.18μF	4
CCT701	050-0078-03	Component circuit	1
CCT702	050-0086-01	Component circuit	1
IC806	051-0138-05	IC TC4001BF	1
	(051-0138-65)	IC (HD14001BFP)	
IC105	051-0172-55	IC μPD4011BG	1
IC805	051-0175-05	IC TC4069UBF	1
	(051-0175-65)	IC (HD14069UBFP)	
IC302~304	051-0285-59	IC BA4560F	3
IC401	051-0296-01	IC TA78L006AP	1
	(051-0296-00)	IC (TA78L006P)	
IC101~104 307,308	051-0350-55	IC NJM4558M	6
IC801	051-0599-51	IC NJM2903	1
	(051-0599-00)	IC (μPC277G2)	
IC202	051-0805-55	IC CXK5816M-15L	1
IC804	051-0820-00	IC S8052ALO	1
IC802,803	051-0821-00	IC S8054ALB	2
IC201	051-0847-00	IC YM-3805	1
IC301	051-0848-00	IC YM-3020	1
IC305,306	051-0853-01	IC M5201FP	2
IC203	051-0994-01	IC NJM2043M	1
IC701	051-1020-00	IC M50747	1
IC601	051-1021-01	IC M50951	1
IC106	051-1022-00	IC NJM319M	1

NOTE: ( )·····INTERCHANGEABILITY

REF.NO.	PART NO.	DESCRIPTION	Q'TY
IC001	051-1025-00	IC BA6351K	1
IC107	051-1027-00	IC NJM072M	1
IC702	051-1029-00	IC	1
X601,701	060-0106-00	Ceramic resonator 4.0MHz	2
X201	061-1065-00	Crystal 8.64MHz	1
Q412,715	100-1048-00	Transistor 2SA1048O,Y,GR	2
	(100-1175-00)	Transistor (2SA1175)	
	(100-1317-00)	Transistor (2SA1317)	
Q404,408,413 708	100-1162-00	Transistor 2SA1162	4
Q403,706	100-1297-00	Transistor 2SA1297	2
Q102,104,108 110,112,114	101-0911-00	Transistor 2SB911MPQR	6
Q107	101-0929-00	Transistor 2SB929	1
Q407	102-1815-00	Transistor 2SC1815	1
Q718	102-2458-00	Transistor 2SC2458-Y,GR,BL	1
Q008,401,409 601,716,801	102-2712-00	Transistor 2SC2712	6
Q405	102-3266-00	Transistor 2SC3266	1
Q717	102-3400-00	Transistor 2SC3400	1
Q101,103,105 109,111,113	103-1227-00	Transistor 2SD1227M	6
Q106	103-1252-00	Transistor 2SD1252	1
Q303,305 312~319	103-1306-05	Transistor 2SD1306NE	10
Q320	103-1504-00	Transistor 2SD1504	1
Q201	125-0001-05	Transistor UN2115	1
Q007,203	125-0002-03	Transistor RN2403	2
	(125-0001-02)	Transistor (UN2112)	
202,204,304 307,602 Q701~705 709~714 802	125-2004-03	Transistor RN1403	17
	(125-2005-02)	Transistor (UN2212)	
001~006 301,302,306 Q308~311 402,406,410 411,707	125-2005-05	Transistor UN2215	18
R414	116-1221-10	Chip resistor 1/8W1.2kΩ	1
R406	116-1501-10	Chip resistor 1/8W15Ω	1
R105,109,110 112,123,124 131,305	117-1011-10	Chip resistor 1/16W100Ω S	8
R023,035,044 316,317 349~352 717	117-1021-10	Chip resistor 1/16W1kΩ S	10
R011,014,027 107,108,111 116,121,122 125,141,143 201,319,320 335,409,411 413 601~603 701,703,711 713,716 718~722 807,809,810 815,816,818	117-1031-10	Chip resistor 1/16W10kΩ S	38
R029,034,040 043,046,050 206,326,327 614,704,709 805,806,813 814,817	117-1041-10	Chip resistor 1/16W100kΩ S	17
R031,056,057 060,221,607 710	117-1051-10	Chip resistor 1/16W1MΩ S	7
R322,324	117-1221-10	Chip resistor 1/16W1.2kΩ S	2
R024,101	117-1231-10	Chip resistor 1/16W12kΩ S	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
R005,135,136 138,139,215 407	117-1521-10	Chip resistor 1/16W1.5kΩ S	7
R008,053,130	117-1531-10	Chip resistor 1/16W15kΩ S	3
R045,055	117-1541-10	Chip resistor 1/16W150kΩ S	2
R309,314	117-1811-10	Chip resistor 1/16W180Ω S	2
R301~304	117-1821-10	Chip resistor 1/16W1.8kΩ S	4
R019,059,134 137	117-1841-10	Chip resistor 1/16W180kΩ S	4
R017,205 222~226	117-2211-10	Chip resistor 1/16W220Ω S	7
R001,002,016 032,052,211 214,613,615 705~708	117-2221-10	Chip resistor 1/16W2.2kΩ S	13
R020,021,033 204,208,210 212,213,216 318,329,330 336,714,811 812	117-2231-10	Chip resistor 1/16W22kΩ S	16
R018	117-2241-10	Chip resistor 1/16W220kΩ S	1
R103	117-2721-10	Chip resistor 1/16W2.7kΩ S	1
R039,140,340 341	117-2731-10	Chip resistor 1/16W27kΩ S	4
R038	117-2741-10	Chip resistor 1/16W270kΩ S	1
R012,209,321 323,331,332 338,339,342 343	117-3321-10	Chip resistor 1/16W3.3kΩ S	10
R026,030,037 604~606 609	117-3331-10	Chip resistor 1/16W33kΩ S	7
R051	117-3931-10	Chip resistor 1/16W39kΩ S	1
R003,048	117-3941-10	Chip resistor 1/16W390kΩ S	2
R025,306,311 801~803	117-4711-10	Chip resistor 1/16W470Ω S	6
R207,348,402 610,611,804	117-4721-10	Chip resistor 1/16W4.7kΩ S	6
R028,325,608	117-4731-10	Chip resistor 1/16W47kΩ S	3
R015,058,132 133,310,315 346,347	117-4741-10	Chip resistor 1/16W470kΩ S	8
R410,412,612	117-5611-10	Chip resistor 1/16W560Ω S	3
R004,022,104	117-5631-10	Chip resistor 1/16W56kΩ S	3
R041,047,115	117-5641-10	Chip resistor 1/16W560kΩ S	3
R054,307,308 312,313	117-6811-10	Chip resistor 1/16W680Ω S	5
R007,202,203 227,715	117-6821-10	Chip resistor 1/16W6.8kΩ S	5
R006,009,010 013,042,049 106,702	117-6831-10	Chip resistor 1/16W68kΩ S	8
R036	117-8211-10	Chip resistor 1/16W820Ω S	1
R328,333,334	117-8221-10	Chip resistor 1/16W8.2kΩ S	3
C344,345	160-2212-05	Ceramic capacitor 220pF B HD	2
C406,605	172-1042-20	Polyester capacitor 0.1μF SS	2
C390,391	171-1522-06	Ceramic capacitor 1500pF SC	2
C001,305	176-1007-00	Ceramic chip capacitor 10pF CH TC,S	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
C204	176-1011-00	Ceramic chip capacitor 100pF CH TC,S	1
C014,213	176-1501-00	Ceramic chip capacitor 15pF CH TC,S	2
C021	176-1511-00	Ceramic chip capacitor 150pF CH TC,S	1
C212	176-1801-00	Ceramic chip capacitor 18pF CH TC,S	1
C008,028,209	176-2211-00	Ceramic chip capacitor 220pF CH TC,S	3
C602,603,701 702	176-3301-00	Ceramic chip capacitor 33pF CH TC,S	4
C328,329	176-3311-00	Ceramic chip capacitor 330pF CH TC,S	2
C218	176-4701-00	Ceramic chip capacitor 47pF CH TC,S	1
C208	176-4711-00	Ceramic chip capacitor 470pF CH TC,S	1
C023	177-3932-05	Ceramic chip capacitor 0.039μF HD	1
C202,206,215	177-4732-05	Ceramic chip capacitor 0.047μF HD	3
C010,025,030 032,103,105 106,217	178-1022-05	Ceramic chip capacitor 1000pF HD,S	8
C026,029,216	178-1032-05	Ceramic chip capacitor 0.01μF HD,S	3
C011,307	178-1222-05	Ceramic chip capacitor 1200pF HD,S	2
C102	178-1522-05	Ceramic chip capacitor 1500pF HD,S	1
C022,312,313	178-1532-05	Ceramic chip capacitor 0.015μF HD,S	3
C334,337	178-1822-05	Ceramic chip capacitor 1800pF HD,S	2
C308,309	178-2222-05	Ceramic chip capacitor 2200pF HD,S	2
C311,314	178-2722-05	Ceramic chip capacitor 2700pF HD,S	2
C019,203,210 316,317	178-3322-05	Ceramic chip capacitor 3300pF HD,S	5
C020,320,321 347,349	178-6822-05	Ceramic chip capacitor 6800pF HD,S	5
C601,608	179-2273-21	Electrolytic capacitor 10V220μF S	2
C101	182-1056-62	Electrolytic capacitor 50V1μF NP SS	1
C414,419	182-1073-22	Electrolytic capacitor 10V100μF SS	2
C104	182-1073-32	Electrolytic capacitor 16V100μF SS	1
C805	183-1043-62	Electrolytic capacitor 50V0.1μF USS	1
C801	183-1053-62	Electrolytic capacitor 50V1μF USS	1
C027,033,110 207,306,318 319,326,327 332,341,342 356,392,393 401,402,403 408,409,412 415,417,605 705,706,802	183-1063-32	Electrolytic capacitor 16V10μF USS	27
C003,012,013 024,031,211 302,303	183-1073-12	Electrolytic capacitor 6.3V100μF USS	8
C002 322~325 330,331,405	183-2253-62	Electrolytic capacitor 50V2.2μF USS	8
C346,348,350 351	183-2263-12	Electrolytic capacitor 6.3V22μF USS	4
C704,804	183-3353-62	Electrolytic capacitor 50V3.3μF USS	2
C333	183-3363-02	Electrolytic capacitor 4V33μF USS	1
C018	183-3363-22	Electrolytic capacitor 10V33μF USS	1
C338,339,803	183-4753-52	Electrolytic capacitor 35V4.7μF USS	3
C332	183-1073-02	Electrolytic capacitor 4V100μF	1

◎CONVERTER P.W.B

NOTE: ( )·····INTERCHANGEABILITY

REF.NO.	PART NO.	DESCRIPTION	Q'TY
D508,509	001-0112-00	Diode 1S1588.V	2
D504	001-0330-00	Diode 1SS119	1
D501,505,510 511	001-0360-00	Diode S5566B	4
D506,507	001-0377-43	Diode MA4082L	2
D502,503	001-0464-00	Diode 1GWJ42	2
L501	009-0470-03	Choke	1
L502	009-0642-00	Choke	1
L503	010-2162-00	Coil	1
RY501	014-0509-00	Relay 5A	1
IC501,502	051-0624-00	IC TA78008AP	2
	(051-0718-00)	IC (NJM7808A)	
	(051-0720-00)	IC (μPC7808H)	
Q505	100-1020-00	Transistor 2SA1020O,Y	1
	(100-0684-00)	Transistor (2SA684QRS)	
Q506,509	100-1048-00	Transistor 2SA1048O,Y,GR	2
	(100-1175-00)	Transistor (2SA1175)	
	(100-1317-00)	Transistor (2SA1317)	
Q501	100-1357-00	Transistor 2SA1357-O,Y	1
Q508	102-1815-00	Transistor 2SC1815	1
Q507	102-2458-00	Transistor 2SC2458	1
	(102-2785-00)	Transistor (2SC2785)	
	(102-3330-00)	Transistor (2SC3330)	

REF.NO.	PART NO.	DESCRIPTION	Q'TY
Q504	102-2594-00	Transistor 2SC2594	1
	(102-3420-00)	Transistor (2SC3420-Y,GR,BL)	
	(103-1683-00)	Transistor (2SD1683)	
Q502,503	102-3400-00	Transistor 2SC3400	2
	(125-2003-03)	Transistor (RN1203)	
	(125-2007-02)	Transistor (DTC124ES)	
R509	111-1001-81	Film resistor 1/2W10Ω	1
C510	160-4712-05	Ceramic capacitor 50V470pF B HD	1
C517	171-1032-06	Ceramic capacitor 0.01μF SR SC	1
C509,513	173-1042-10	Polyester capacitor 50V0.1μF S	2
C508,512	179-1073-22	Electrolytic capacitor 10V100μF S	2
C503	179-1073-33	Electrolytic capacitor 16V100μF S	1
C515	179-2273-23	Electrolytic capacitor 10V220μF S	1
C504	179-2273-33	Electrolytic capacitor 16V220μF S	1
C514	179-4763-22	Electrolytic capacitor 10V47μF S	1
C516	179-4763-32	Electrolytic capacitor 16V47μF S	1
C507	179-4773-33	Electrolytic capacitor 16V470μF S	1
C501,502,505 506,511,518	183-1063-32	Electrolytic capacitor 16V10μF USS	6

◎ESCUTCHEON P.W.B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
D901~906 913,914	001-0459-01	Diode GL9HD44 RED	8
D915~917 928	001-0482-03	Diode LN81RC	4
D907~912	001-0483-02	Diode LT8H257	6
D918~927	001-0483-03	Diode LT8S257	10
VR901~904	012-4693-00	Variable resistor SLIDE	2
S 901~908 915,916 919~921	013-3812-00	Switch	13
S 909~914 917,918	013-3853-00	Switch	8
P901~903	017-0337-06	Pilot lamp	3

REF.NO.	PART NO.	DESCRIPTION	Q'TY
C901,902	043-0228-00	Ceramic chip capacitor 0.15μF	2
CCT901	050-0104-00	Component circuit CR-B/T	1
IC901	051-0836-00	IC LC7582	1
IC902	051-1026-00	IC IR2E27A	1
R911	116-3911-10	Chip resistor 1/8W390Ω	1
C906	160-6812-05	Ceramic capacitor 680pF B HD	1
C903	183-1063-32	Electrolytic capacitor 16V10μF USS	1
C904,905	183-4753-52	Electrolytic capacitor 35V4.7μF USS	2

NOTE : OM (Oxidized Metal) SS (Super Small)
S (Small) TC (Temperature-Compensating)
HD (Higher Dielectric) LL (Low Leak)
SC (Semi-Conductor) USS (Ultra Super Small)

■INSTRUCTION FOR CIRCUIT DIAGRAM:

① **CD SERVO CONTROL & SIGNAL CIRCUIT**
It acts for demodulation of EFM signal from optical-pickup, detecting/correction of error-signal, signal-processings of digital filter, etc., and servo-control of focus, disc tracking, feed.

② **CD-ANALOGUE SERVO CIRCUIT**
It acts as analogue servo of focus, disc, tracking, feed of CD.

③ **DISC MOTOR DRIVE CIRCUIT**
It drives the disc motor by output signal of disc servo.

④ **FOCUS DRIVE CIRCUIT**
It drives the focus coil by output signal of focus-servo.

⑤ **FEED MOTOR DRIVE CIRCUIT**
It drives the feed motor by output signal of feed servo.

⑥ **TRACKING DRIVE CIRCUIT**
It drives the tracking coil by output signal of tracking servo.

⑦ **SHOCK DETECTION CIRCUIT**
By detecting the shock with signal from the shock sensor, signal is sent to SLC (IC001).

⑧ **D/A CONVERSION CIRCUIT**
It converts the digital signal from SPC (IC201) into analogue signal.

⑨ **LOW-PASS FILTER CIRCUIT**
It cuts the high-frequency factor of analogue-signal from DAC (IC301) by active filter.

⑩ **CD/TUNER SIGNAL SWITCHING CIRCUIT**
It switches the audio signal of tuner with CD by master micro computer (IC701).

⑪ **AMP CIRCUIT**
It acts to amplify the audio signal of tuner or CD.

⑫ **LOUDNESS CIRCUIT**
It sets the loudness-effect to ON/OFF by the master micro computer (IC701).

⑬ **AMP & MUTING CIRCUIT**
It acts to amplify the audio signal of tuner or CD. Also, it gives muting effect.

⑭ **ACC 5V**
Power will be supplied by converting ACC 14V and main +B 14V into ACC 5V.

⑮ **BACK-UP 5V**
Power will be supplied by converting back-up 14V into back-up 5V.

⑯ **CD LASER POWER SOURCE**
It sets CD +B 14V to ON/OFF by LS-signal, and it is converted into 5V and supplied to the laser.

⑰ **CD +5V POWER SOURCE**
It sets +8V to ON/OFF by DC signal, and power is supplied by conversion into CD +5V.

⑱ **CD −5V POWER SOURCE**
It sets −8V to ON/OFF by DC-signal, and power is supplied by conversion into CD −5V.

⑲ **POWER CIRCUIT**
Each power supply can be made.

⑳ **DC/DC CONVERTER CIRCUIT**
Power supplied by conversion from CD +B 14V and main +B 14V into −8V.

㉑ **MASTER CONTROL CIRCUIT**
Whole system controls for tuner and slave (CD control) can be made.

㉒ **TUNER DATA LINE VOLTAGE CONVERSION CIRCUIT**
Data-line voltage to the tuner is transmitted with 5V~0.6V.

㉓ **CD CONTROL CIRCUIT**
It controls the system of CD-play.

㉔ **HIGH TEMPERATURE DETECTION CIRCUIT**
It detects high temperature (over +60°C) and stops CD operation.

㉕ **DISC REVOLUTION DETECTION CIRCUIT**
It detects CD-disc revolution, and transmits it to the slave (IC601), and stops the disc at time of high-speed revolution (abnormal action).

㉖ **ACC, BACK UP DETECTION CIRCUIT**
It detects ACC 14V, back-up 5V, and transmits the reset, CE, back-up to master, slave.

㉗ **FRONT PANEL SWITCH**
Switch of front operation panel.

㉘ **BASS/TREBLE CIRCUIT**
It gives bass and treble effect of audio signal.

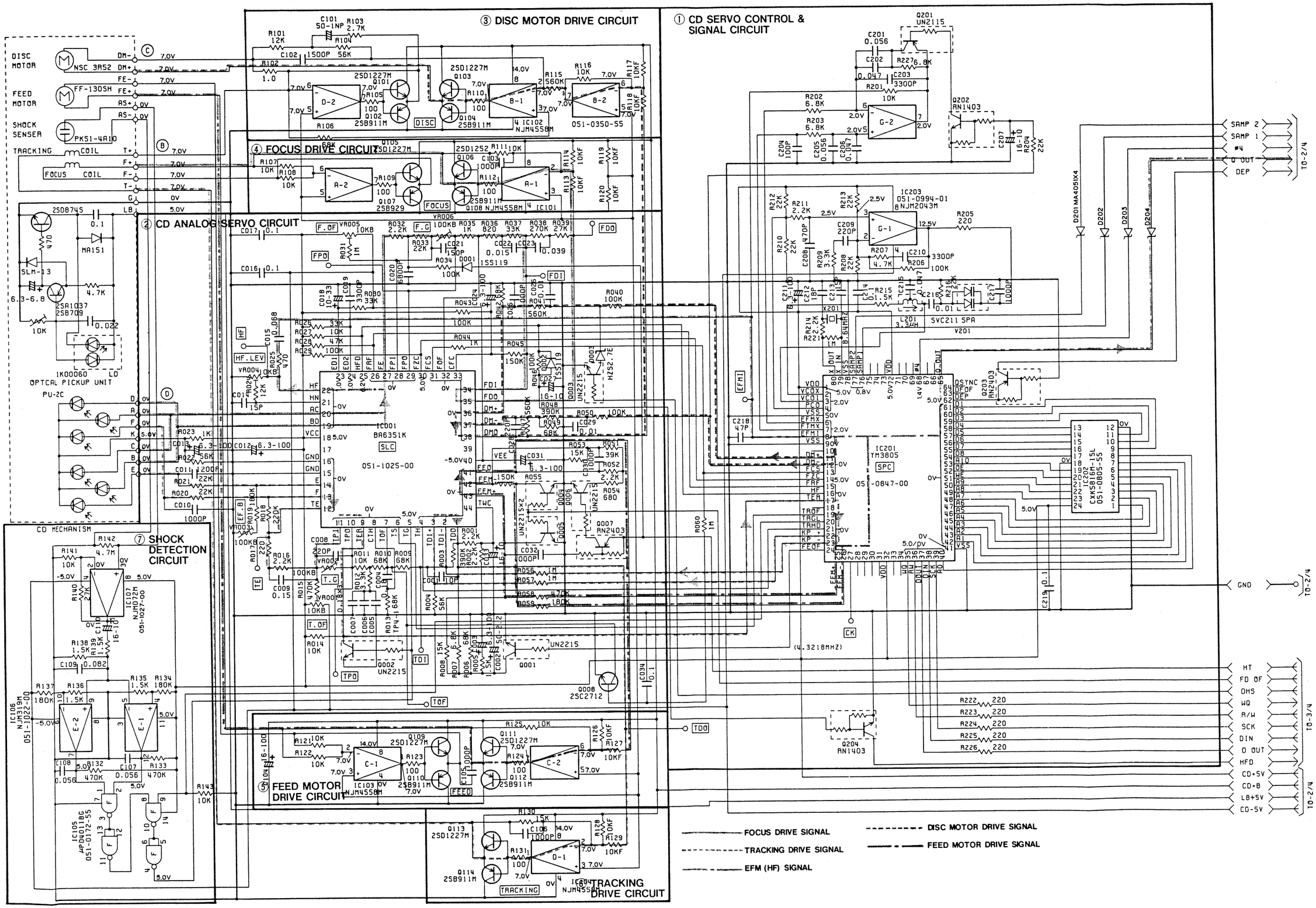
㉙ **LED**
Lighting (and its outing) of LED is made with ON/OFF of radio, disc, loud, play.

㉚ **LEVEL INDICATOR CIRCUIT**
It lights LED for the level of audio signal.

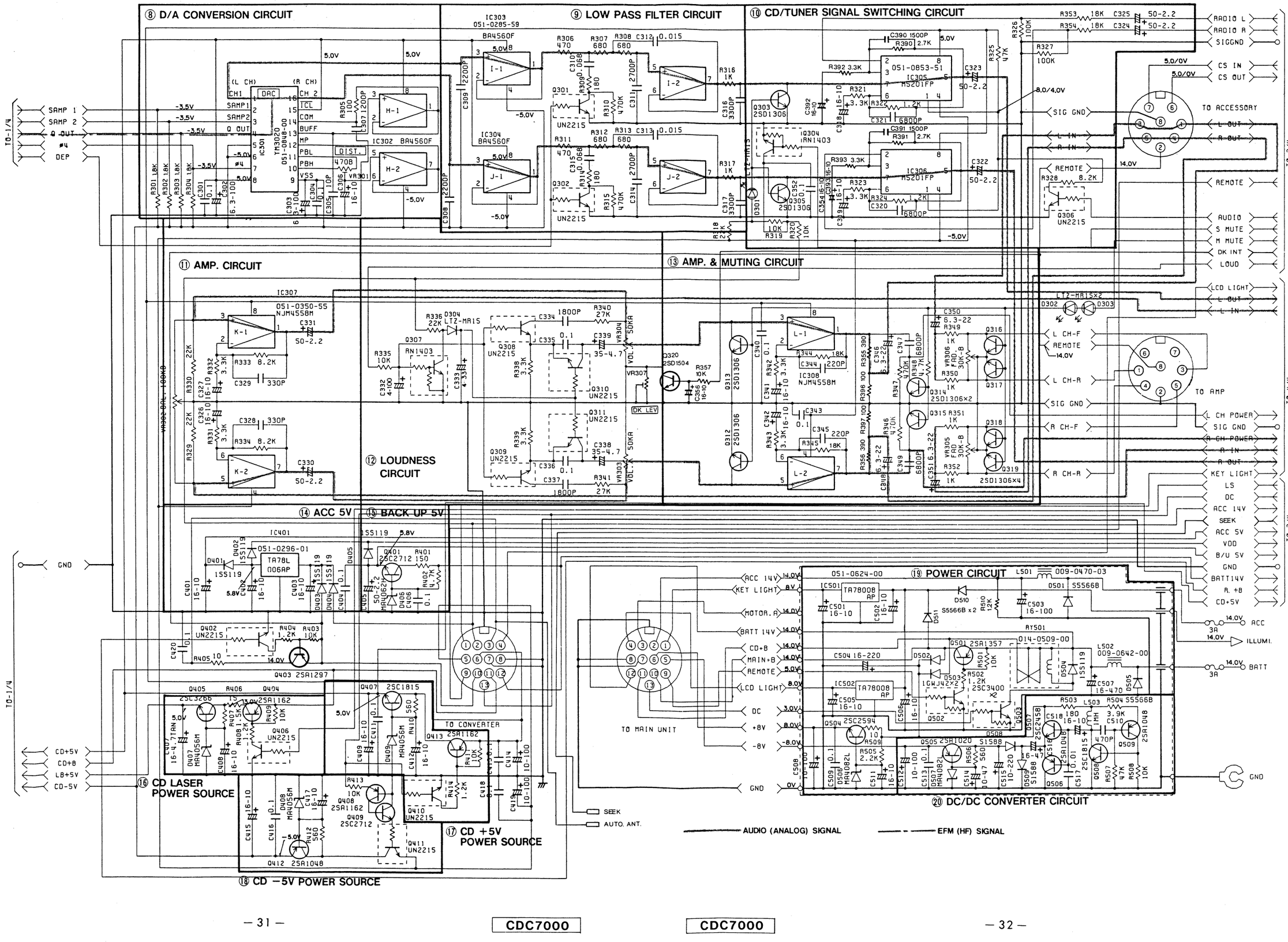
㉛ **PILOT LAMP**
It lights the front operation panel by pilot lamp.

㉜ **LCD CONTROL CIRCUIT**
It lights the lamp by control of the front LCD.

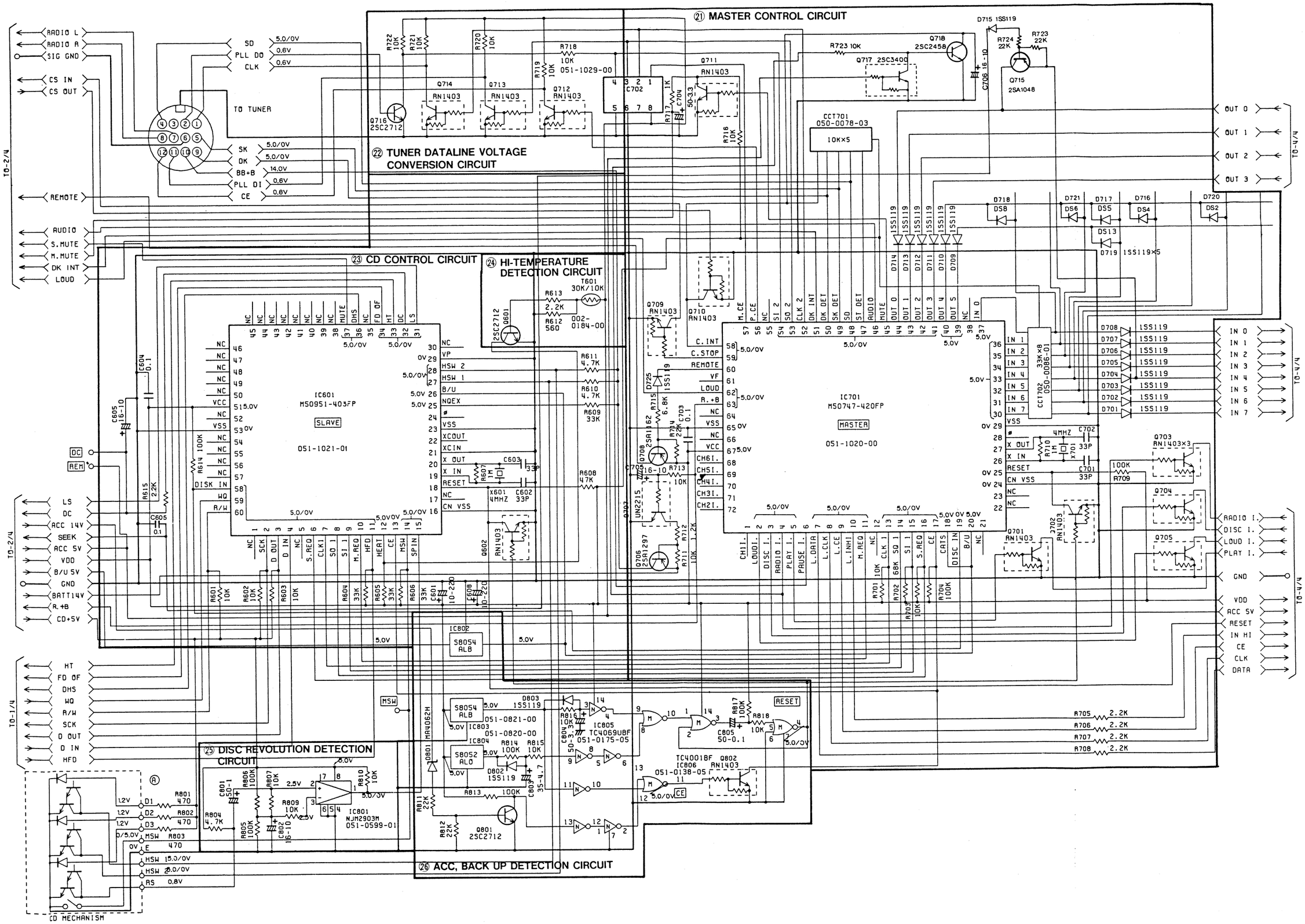
■CIRCUIT DIAGRAM: (1/4)



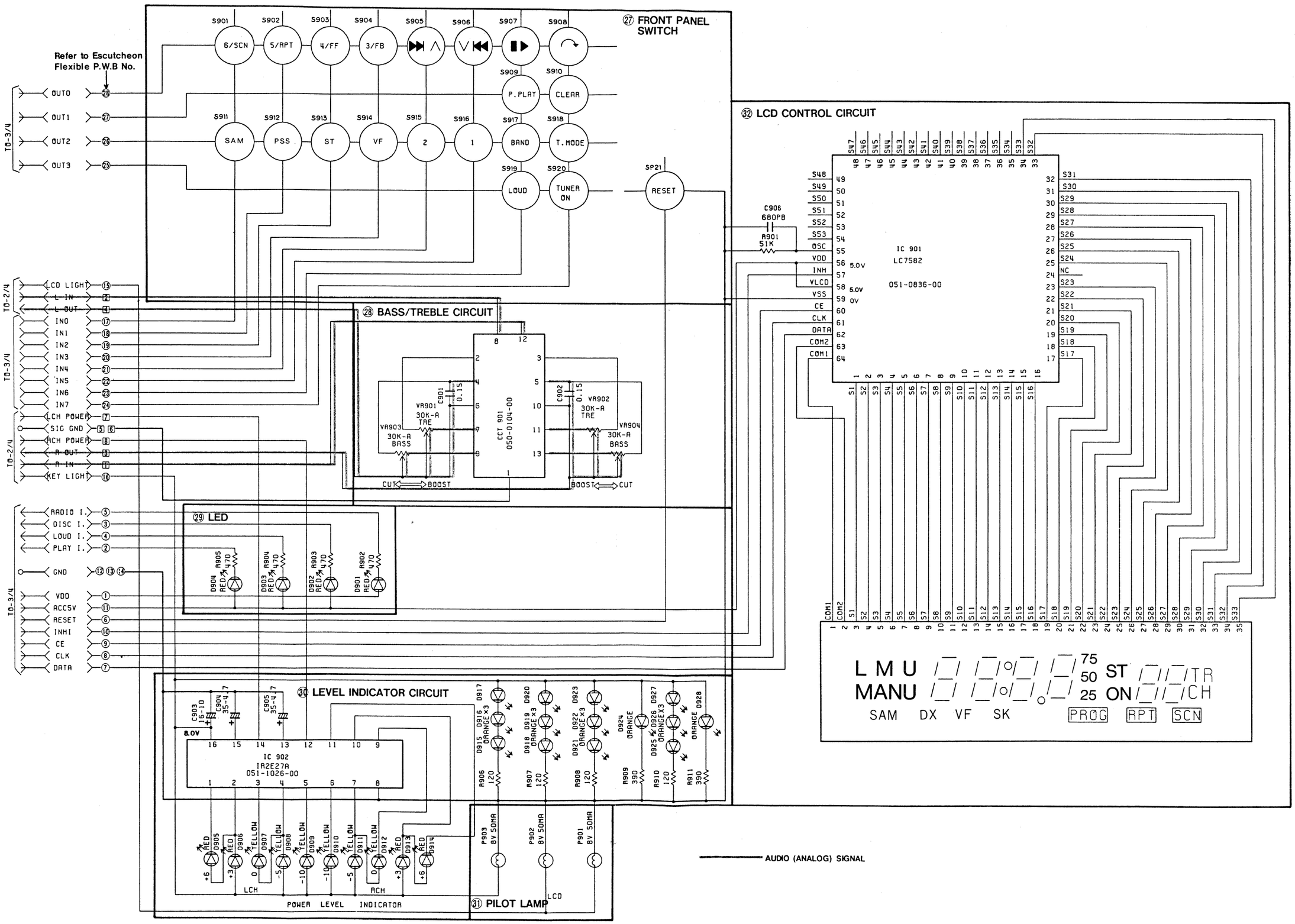
■CIRCUIT DIAGRAM: (2/4)



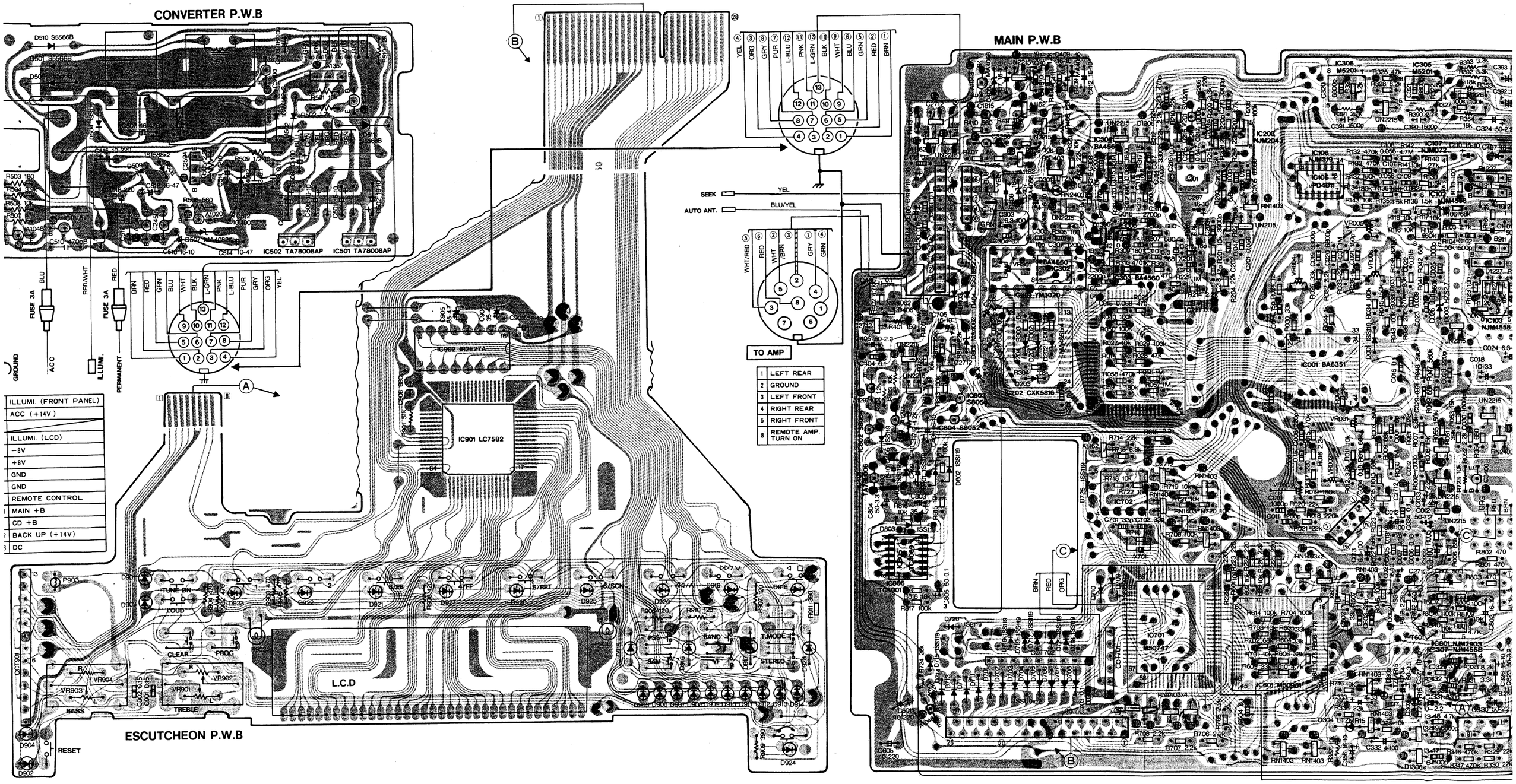
■CIRCUIT DIAGRAM: (3/4)



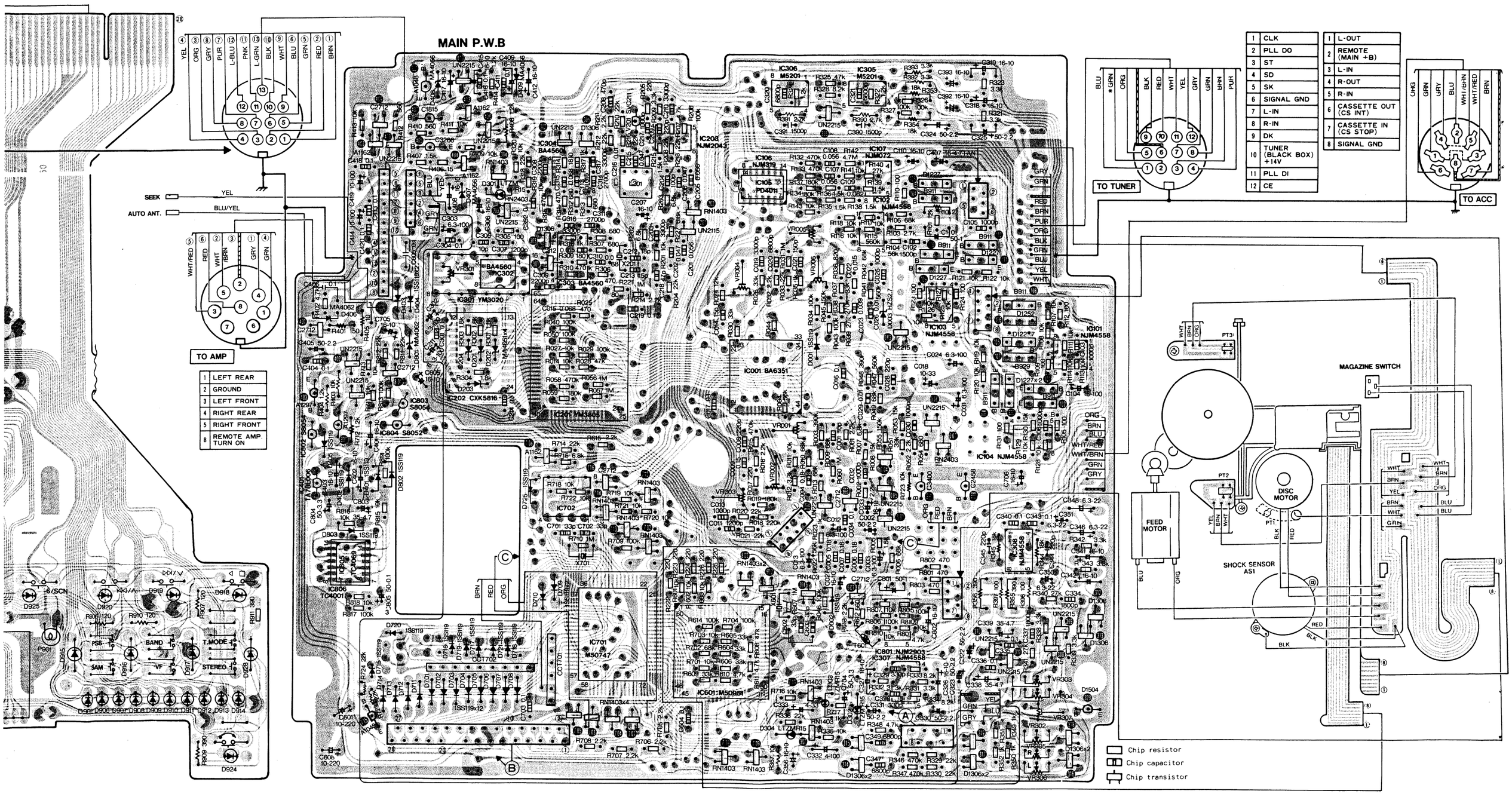
■CIRCUIT DIAGRAM: (4/4)



PRINTED WIRING BOARD:



CDC7000


MAIN P.W.B
TO AMP
1 LEFT REAR
2 GROUND
3 LEFT FRONT
4 RIGHT REAR
5 RIGHT FRONT
8 REMOTE AMP. TURN ON
SEEK
AUTO ANT.
YEL
BLU/YEL
TO TUNER
1 CLK
2 PLL DO
3 ST
4 SD
5 SK
6 SIGNAL GND
7 L-IN
8 R-IN
9 DK
10 TUNER (BLACK BOX) +14V
11 PLL DI
12 CE
1 L-OUT
2 REMOTE (MAIN +B)
3 L-IN
4 R-OUT
5 R-IN
6 CASSETTE OUT (CS INT)
7 CASSETTE IN (CS STOP)
8 SIGNAL GND
TO ACC
MAGAZINE SWITCH
FEED MOTOR
DISC MOTOR
SHOCK SENSOR AS1
Chip resistor
Chip capacitor
Chip transistor

EE-695A-51

EXPLANATION OF IC's:

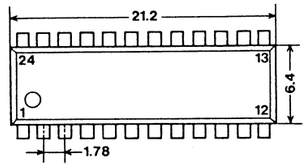
EE-695A-51

Refer to description in IC service manual vol. 1			
A2110	051-0407-00	FM Noise Canceller	P17
A3365	051-0501-00	PLL FM Multiplex Stereo Demodulator (DK Type)	P15

Refer to description in IC service manual vol. 2			
IA12438FP	051-0730-00	FM Frontend	P7
IJM4558S	051-0285-51	Dual OP. Amp.	P39
A78L005AP	051-0352-00	3 terminal regulator	P48
A3430	051-0733-01	FM MPX	P9
A7411AP	051-0798-21	FM IF System	P8
A2220	051-0739-00	ARI System SK Type	P11

■LC7217 051-0867-00 Electronic Tuning PLL Frequency Synthesizer for AV

Outward Form



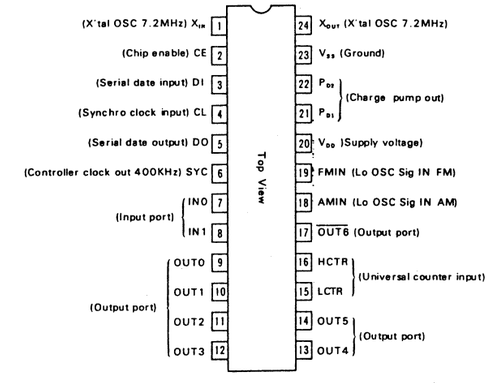
Features

Abundant reference frequency I/O ports for AV. General purpose counter built in

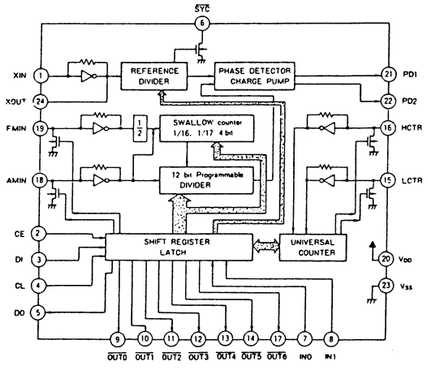
Absolute Maximum Ratings (Ta=25°C, Vss=0V)

Item	Symbol	Terminal Name	Rating	Unit
Supply voltage	V_{DD}	V_{DD}	−0.3 to 7.0	V
Input voltage	V_{IN}(1)	CE, CL, DI, IN-0, IN-1	−0.3 to 7.0	V
	V_{IN}(2)	Input terminal of other V_{IN}(1)	−0.3 to V_{DD}+0.3	V
Output voltage	V_{OUT}(1)	DO, $\overline{SYC}$	−0.3 to 7.0	V
	V_{OUT}(2)	$\overline{OUT1}$, $\overline{OUT2}$	−0.3 to V_{DD}+0.3	V
	V_{OUT}(3)	$\overline{OUT3}$ to $\overline{OUT6}$, $\overline{OUT0}$	−0.3 to 15	V
	V_{OUT}(4)	Input terminal of other V_{OUT}(1), (2), (3)	−0.3 to V_{DD}+0.3	V
Power dissipation	Pd max	Ta ≤ 85°C	350	mW

Terminal Connection

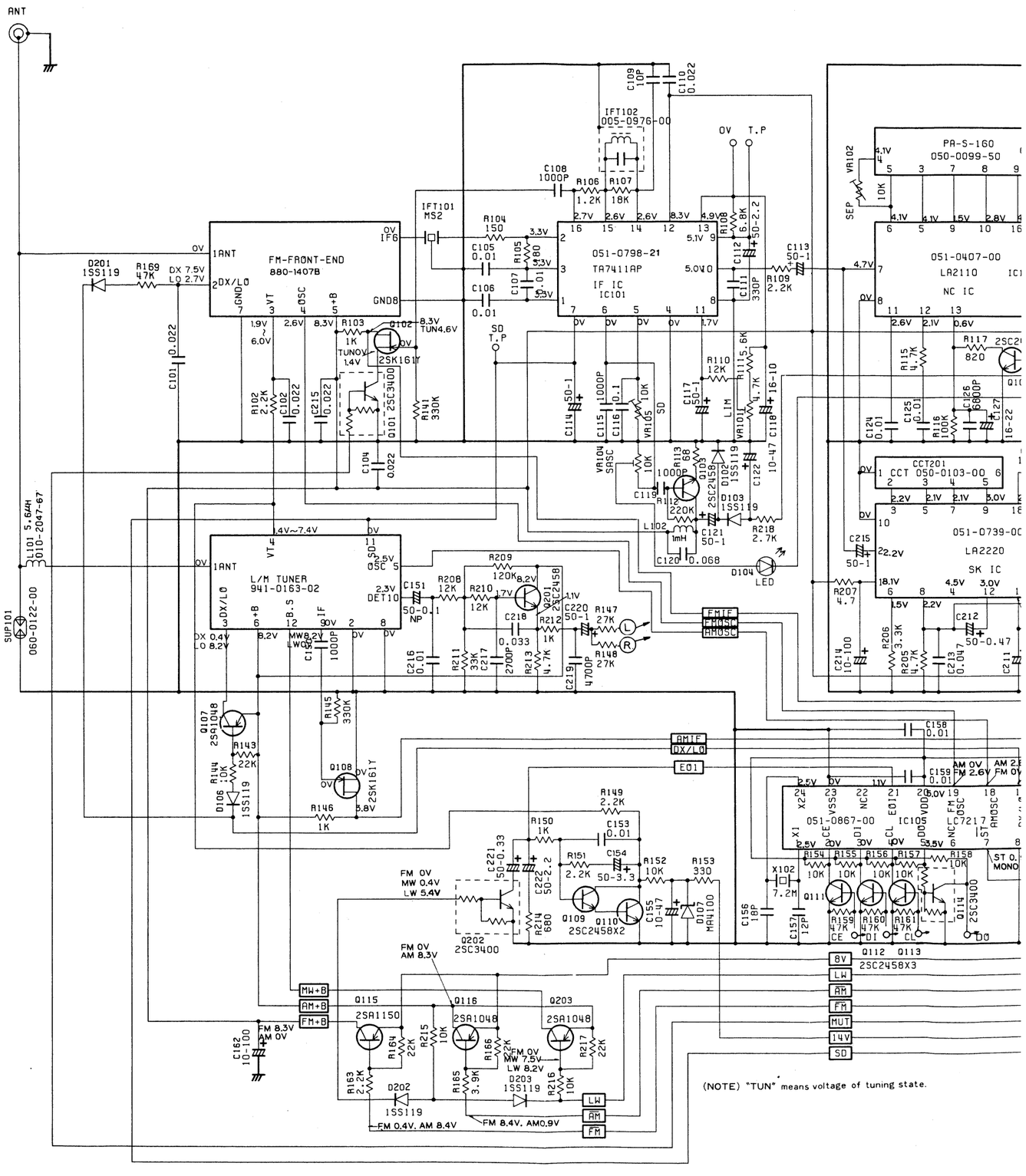


Block Diagram



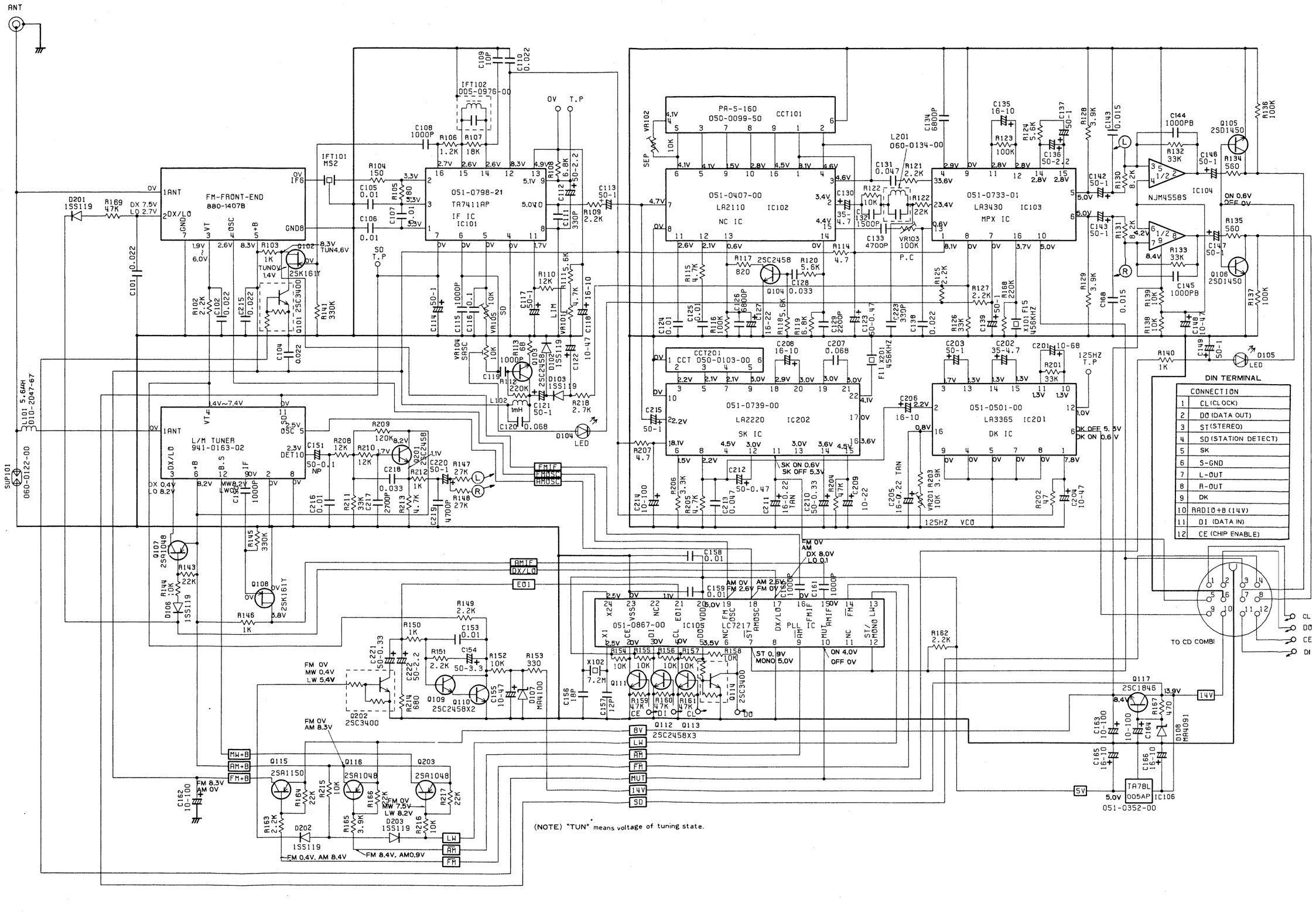
CIRCUIT DIAGRAM:

◎EE-695A-51



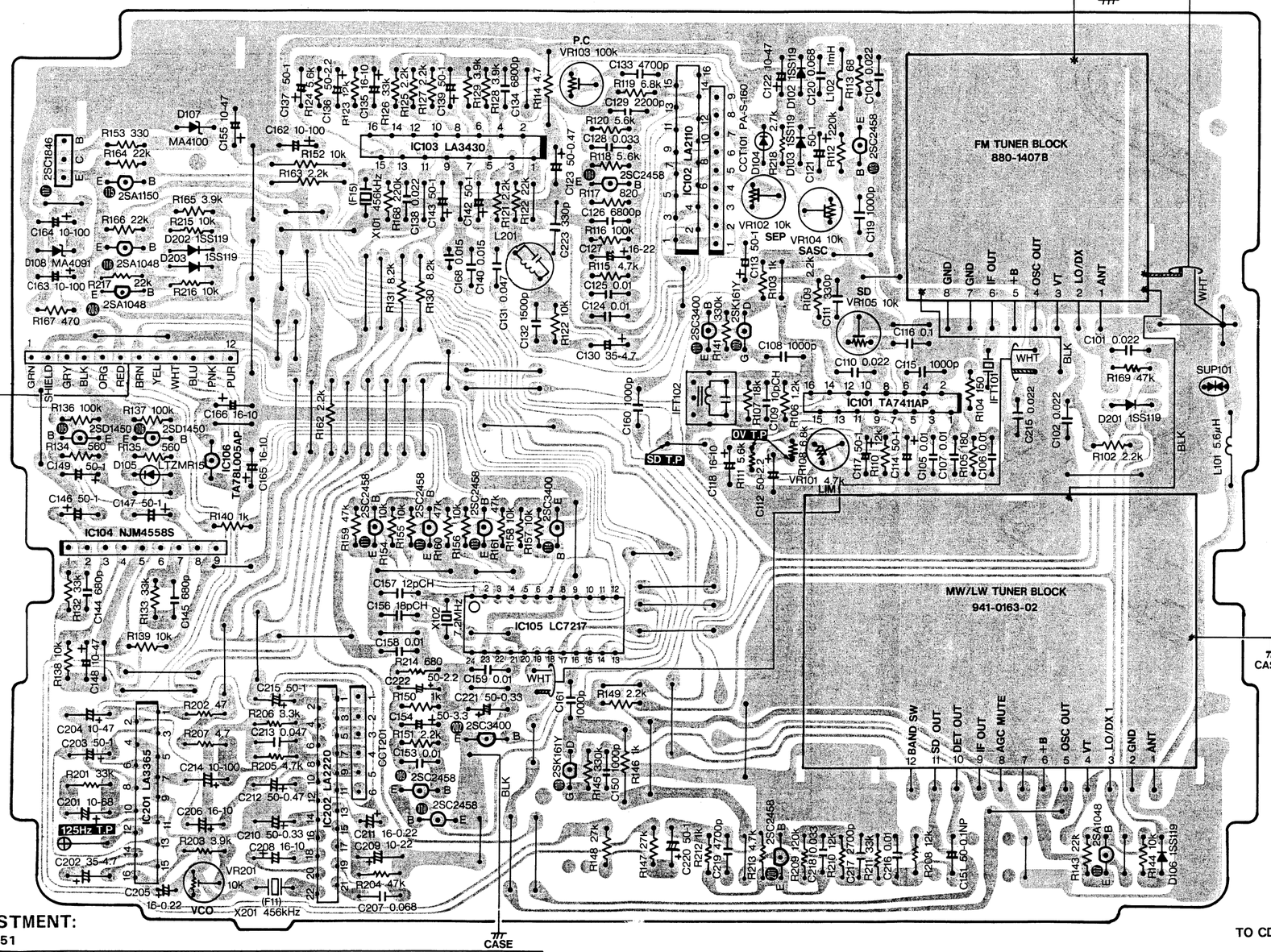
■CIRCUIT DIAGRAM:

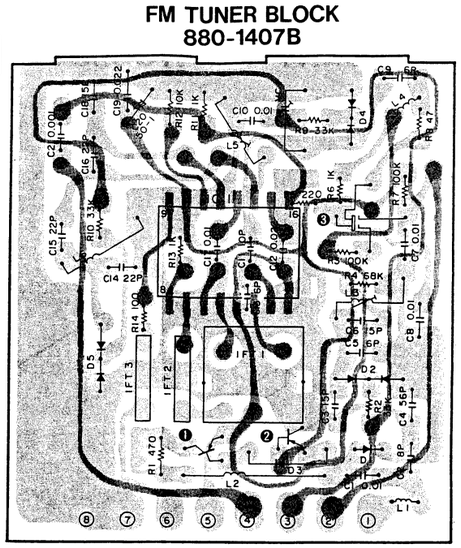
◎EE-695A-51



■PRINTED WIRING BOARD:

◎EE-695A-51



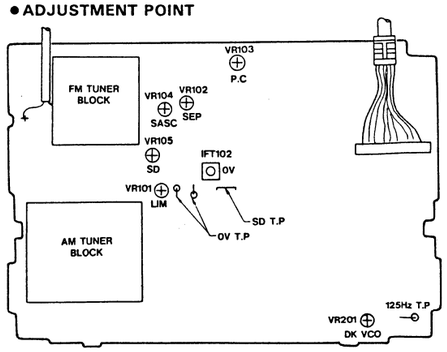


■ADJUSTMENT:

◎EE-695A-51

Adjustment item	Adjustment point	Procedure
0V fine adjustment	IFT102	1. Tune 98.0MHz and input a 25dB SSG signal. 2. Connect a digital volt meter 0V TP. 3. Adjust IFT102 so that the voltage is 0V±30mV.
Stop seek sensitivity (SD)	VR105	1. Tune at 98.0MHz and input a 25dB SSG signal. 2. Adjust VR105 so that the voltage of SD TP is 5V.
Limiter	VR101	1. Tune at 98.0MHz and input a 55dB SSG signal. 2. Adjust VR to make the set output 0dB. 3. Reduce the output of SSG 12dB. 4. Adjust VR101 untill output level decrease to 3dB.
SASC	VR104	1. Tune at 98.0MHz and input a 65dB (7kHz modulation frequency) SSG signal. 2. Adjust the output level of the volume controller to 0dB. 3. Set the SSG output to 38dB and adjust VR104 so that the output level is −2dB.
MPX Separation	VR102	1. Tune at 98.0MHz and input a 65dB SSG signal. (ST modulator, MOD 100%) 2. Set the ST modulator to the L or R ch only, and adjust VR102 so that the maximum separation is obtained.
MPX Pilot canceller	VR103	1. Tune at 98.0MHz and input a 65dB SSG signal. (ST modulator, MOD 100%) 2. Cut the main of ST modulator to the pilot signal only, and adjust VR103 so that output of the set is minimum.
DK VCO	VR201	1. Tune at 98.0MHz, input a 65dB SSG signal, and turn on VF. SW. 2. Connect the frequency counter to 125Hz TP and adjust VR201 so that the counter indicates 125±1Hz.

● ADJUSTMENT POINT



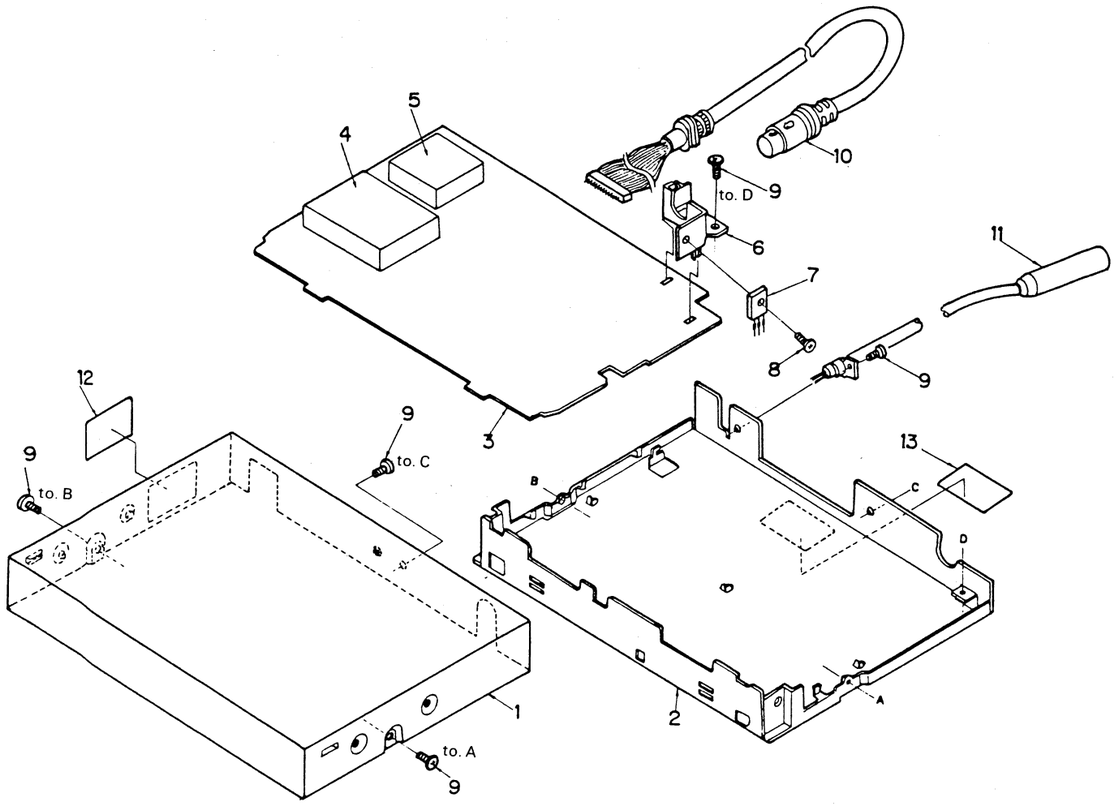
TO CD COMBI 12P

	CONNECTION
1	CL (CLOCK)
2	DO (DATA OUT)
3	ST (STEREO)
4	SD (STATION DETECT)
5	SK
6	S-GND
7	L-OUT
8	R-OUT
9	DK
10	RADIO +B (14V)
11	DI (DATA IN)
12	CE (CHIP ENABLE)

■EXPLODED VIEW • PARTS LIST:

◎EE-695A-51

◎Main section



REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	310-1340-01	Upper case	1
2	311-1200-01	Lower case	1
3	099-8256-02	P.W.B	1
4	941-0163-02	MW/LW Tuner Block ass'y	1
5	880-1407B	FM Tuner Block ass'y	1
6	330-8854-00	Holder	1
7	102-1846-00	Transistor (2SC1846QRS)	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
8	714-3006-81	Machine screw (M3x6)	1
9	731-3006-80	Tap tight (M3x6)	5
10	854-0261-00	Extension lead (1.5m)	1
11	092-0624-00	Antenna receptacle	1
12	285-1257-00	Guide label	1
13	286-6998-00	Set plate	1

■PARTS LIST:

◎EE-695A-51

◎Electrical section

◎MAIN P.W.B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
D102,103,106 201,202,203	001-0330-00	Diode 1SS119	6
D104,105	001-0366-00	Diode LTZ-MR15	2
D108	001-0423-24	Diode MA4091	1
D107	001-0423-25	Diode MA4100	1
IFT101	005-0865-01	IF-transformer	1
IFT102	005-0976-00	IF-transformer	1
L 102	010-2046-44	Coil 1mH	1
L 101	010-2047-67	Coil 5.6μH	1
VR101	012-3808-05	Variable resistor 4.7kΩ	1
VR102,104 105,201	012-3808-06	Variable resistor 10kΩ	4
VR103	012-3808-10	Variable resistor 100kΩ	1
CCT101	050-0099-50	Component circuit	1
CCT201	050-0103-00	Component circuit	1
IC104	051-0285-51	IC NJM4558S	1
IC106	051-0352-00	IC TA78L005AP	1
IC102	051-0407-00	IC LA2110	1
IC201	051-0501-00	IC LA3365	1
IC103	051-0733-01	IC LA3430	1
IC202	051-0739-00	IC LA2220	1
IC101	051-0798-21	IC TA7411AP	1
IC105	051-0867-00	IC LC7217	1
X201	060-0115-01	Ceramic resonator F11; 456kHz	1
X101	060-0115-02	Ceramic resonator F15; 456kHz	1
SUP101	060-0122-00	Surge protector DSP-301N	1
L 201	060-0134-00	Coil	1
X102	061-1066-00	Crystal 7.2MHz	1
Q107,116,203	100-1048-00	Transistor 2SA1048-O,Y,GR	3
Q115	100-1150-00	Transistor 2SA1150-O,Y	1
Q117	102-1846-00	Transistor 2SC1846QRS	1
103,104 Q109~113 201	102-2458-51	Transistor 2SC2458-GR,BL	8
Q101,114,202	102-3400-00	Transistor 2SC3400AC	3
Q105,106	103-1450-00	Transistor 2SD1450RST	2
Q102,108	108-0161-25	FET 2SK161Y	2
C116	043-0165-20	Ceramic capacitor 0.1μF	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
108,115,119 C144,145,150 160,161	160-1022-05	Ceramic capacitor 1000pF HD	8
C132	160-1522-05	Ceramic capacitor 1500pF HD	1
C129	160-2222-05	Ceramic capacitor 2200pF HD	1
C217	160-2722-05	Ceramic capacitor 2700pF HD	1
C111,223	160-3312-05	Ceramic capacitor 330pF HD	2
C133,219	160-4722-05	Ceramic capacitor 4700pF HD	2
C126,134	160-6822-05	Ceramic capacitor 6800pF HD	2
105,106,107 C124,125,153 158,159,216	171-1033-06	Ceramic capacitor 0.01μF SC	9
C143,168	171-1533-06	Ceramic capacitor 0.015μF SC	2
C101,102,104 C110,138,215	171-2233-06	Ceramic capacitor 0.022μF SC	6
C128,218	171-3333-06	Ceramic capacitor 0.033μF SC	2
C131,213	171-4733-06	Ceramic capacitor 0.047μF SC	2
C120	171-6833-06	Ceramic capacitor 0.068μF SC	1
C207	172-6832-20	Polyester capacitor 0.068μF SS	1
C109	174-1000-13	Ceramic capacitor 10pF CH TC	1
C157	174-1200-13	Ceramic capacitor 12pF CH TC	1
C156	174-1800-13	Ceramic capacitor 18pF CH TC	1
C205,211	042-0249-00	Tantalum capacitor 16V0.22μF	2
C162,163,164 C214	179-1073-22	Electrolytic capacitor 10V100μF S	4
C122,148,155 C204	179-4763-22	Electrolytic capacitor 10V47μF S	4
C151	182-1046-62	Electrolytic capacitor 50V0.1μF NP SS	1
113,114,117 121,137,139 C142,143,146 147,149,203 215,220	182-1053-62	Electrolytic capacitor 50V1μF SS	14
C118,135,165 C166,206,208	182-1063-32	Electrolytic capacitor 16V10μF SS	6
C112,136,222	182-2253-62	Electrolytic capacitor 50V2.2μF SS	3
C209	182-2263-22	Electrolytic capacitor 10V22μF SS	1
C127	182-2263-32	Electrolytic capacitor 16V22μF SS	1
C210,221	182-3343-62	Electrolytic capacitor 50V0.33μF SS	2
C154	182-3353-62	Electrolytic capacitor 50V3.3μF SS	1
C123,212	182-4743-62	Electrolytic capacitor 50V0.47μF SS	2
C130,202	182-4753-52	Electrolytic capacitor 35V4.7μF SS	2
C201	183-6863-22	Electrolytic capacitor 10V68μF USS	1

◎FM TUNER BLOCK 880-1407B

Ref. No.	Part No. (Order No.)	Description	Q'ty
D1	001-0368-00	Diode (1SV121)	1
D3	001-0423-13	Diode (MA4033)	1
D2,4,5	001-0442-00	Diode (1SV147)	3
VC1	004-1567-00	Trimer (20P)	1
IFT1	005-0966-00	IF-Transfomer	1
IFT2,3	005-0967-00	IF-Transfomer (MS3LK)	2
L4	010-1570-01	Coil (RF)	1
L1	010-2046-03	Coil (0.39μH)	1
L2	010-2046-14	Coil (3.3μH)	1
L6	010-2104-00	Coil (OSC)	1
L3,5	010-2105-00	Coil (L4.5T)	2
IC1	051-0730-00	IC (HA12438FP)	1
R14	117-1011-10	Chip resistor (1/16W 100Ω)	1
R6,11,13	117-1021-10	Chip resistor (1kΩ)	3
R12	117-1031-10	Chip resistor (10kΩ)	1
R3,7	117-1041-10	Chip resistor (100kΩ)	2
R5	117-2211-10	Chip resistor (220Ω)	1

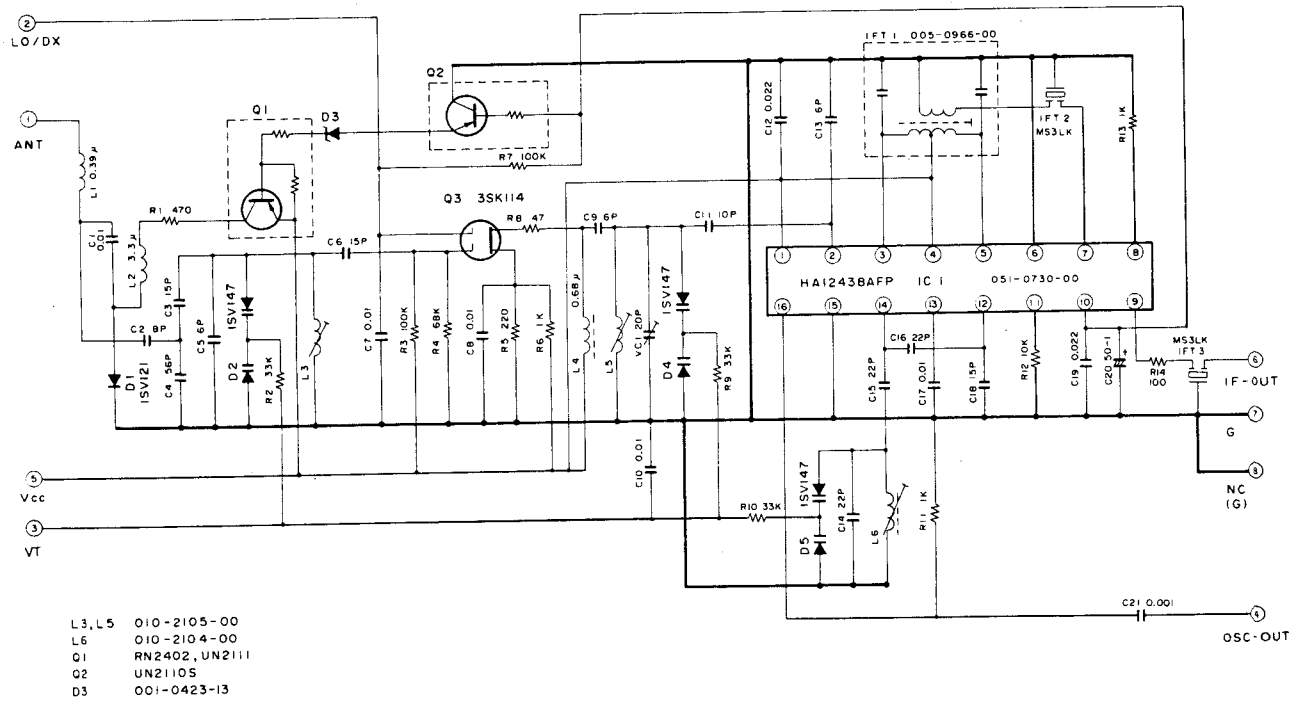
Ref. No.	Part No. (Order No.)	Description	Q'ty
R2,9,10	117-3331-10	Chip resistor (33kΩ)	3
R8	117-4701-10	Chip resistor (47Ω)	1
R4	117-6831-10	Chip resistor (68kΩ)	1
Q3	124-0114-15	Transistor (3SK114)	1
Q1	125-0001-01	Transistor (UN2111)	1
Q2	125-0006-00	Transistor (UN2110)	1
C11	176-1007-00	Ceramic chip capacitor (10pF)	1
C3,6,18	176-1501-00	Ceramic chip capacitor (15pF)	3
C14,15,16	176-2201-00	Ceramic chip capacitor (22pF)	3
C4	176-5601-00	Ceramic chip capacitor (56pF)	1
C5,9,13	176-6097-00	Ceramic chip capacitor (6pF)	3
C2	176-8097-00	Ceramic chip capacitor (8pF)	1
C21	178-1022-05	eramic chip capacitor (0.001μF)	1
C1,7,8,10,17	178-1032-05	Ceramic chip capacitor (0.01μF)	5
C12,19	178-2232-05	Ceramic chip capacitor (0.022μF)	2
C20	183-1053-62	Electrolytic capacitor (50V 1μF)	1

NOTE : OM (Oxidized Metal) SS (Super Small)
S (Small) TC (Temperature-Compensating)
HD (Higher Dielectric) LL (Low Leak)
SC (Semi-Conductor) USS (Ultra Super Small)

■BLOCK Ass'y CIRCUIT DIAGRAM:

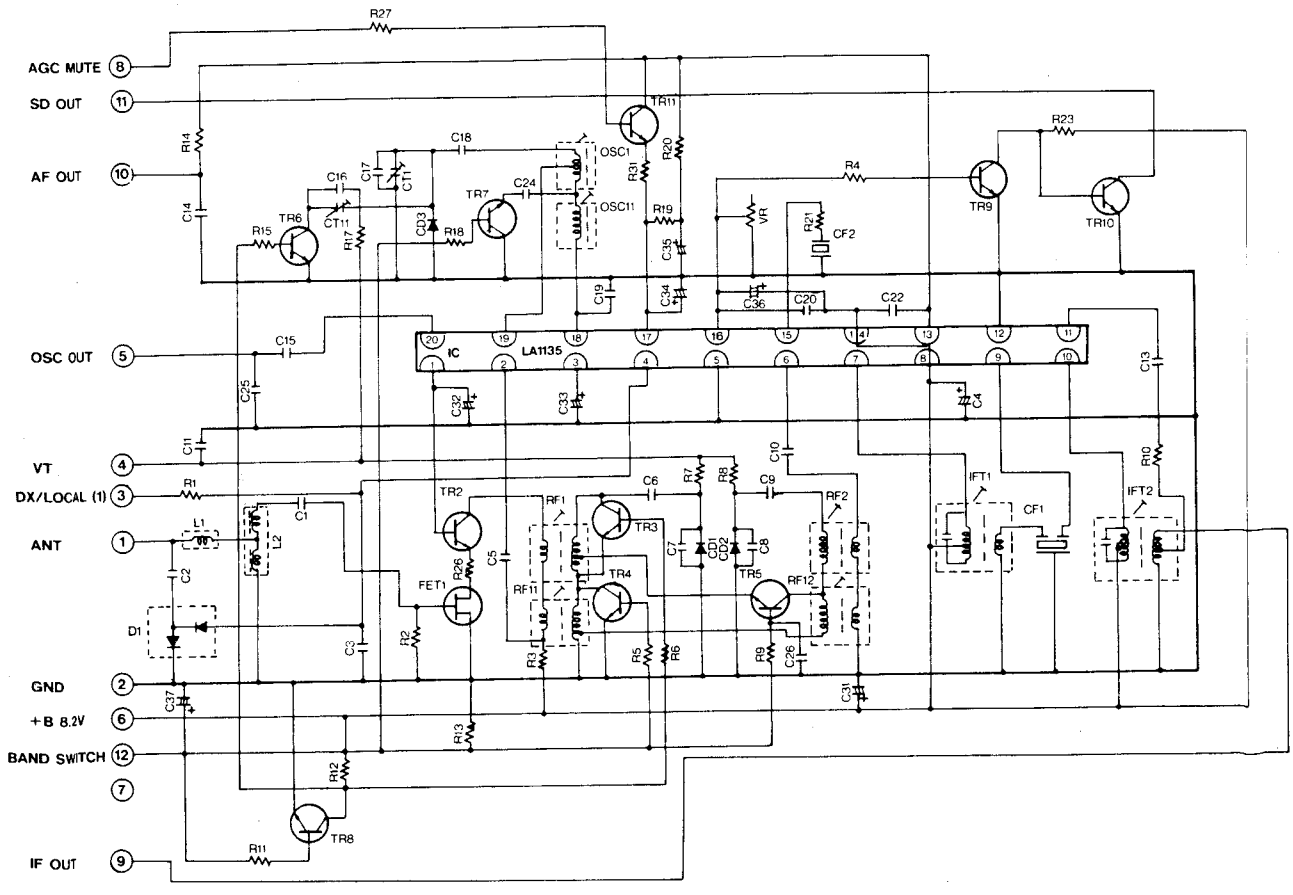
◎EE-695A-51

◎FM TUNER BLOCK Ass'y 880-1407B



L3, L5 010-2105-00
L6 010-2104-00
Q1 RN2402, UN2111
Q2 UN2110S
D3 001-0423-13

◎MW/LW TUNER BLOCK Ass'y 941-0163-02



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